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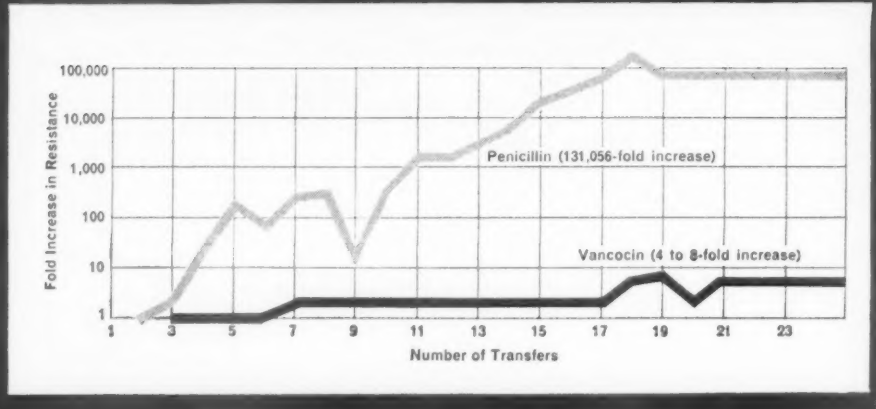

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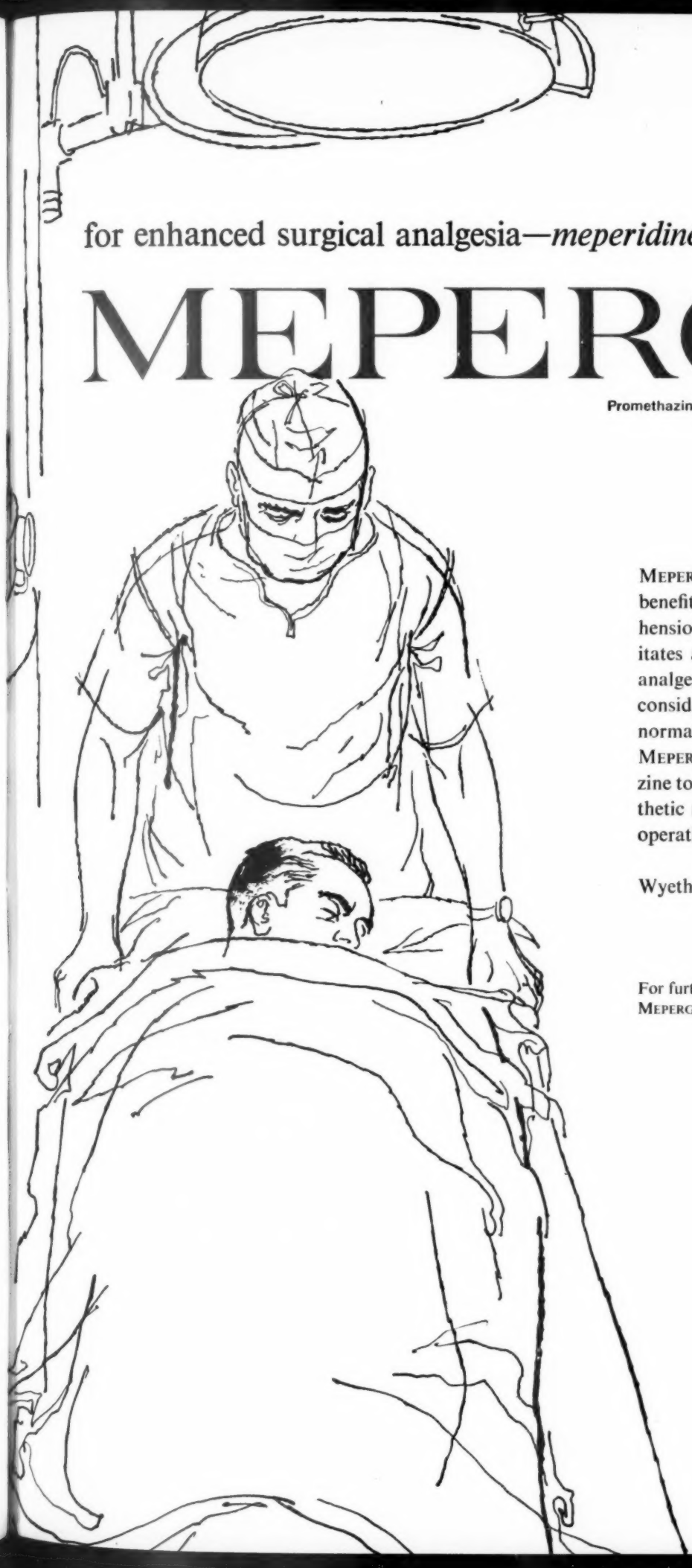

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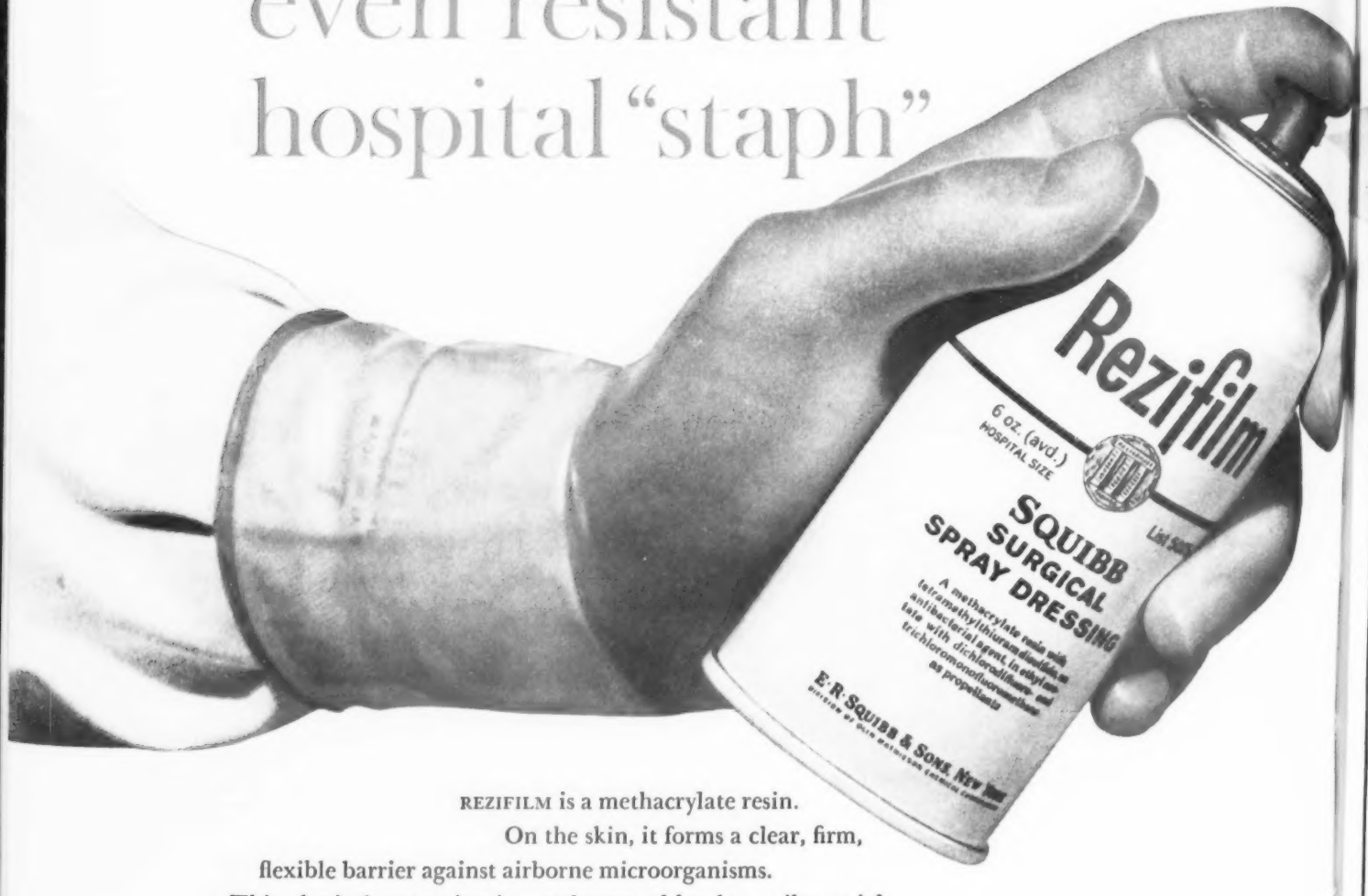

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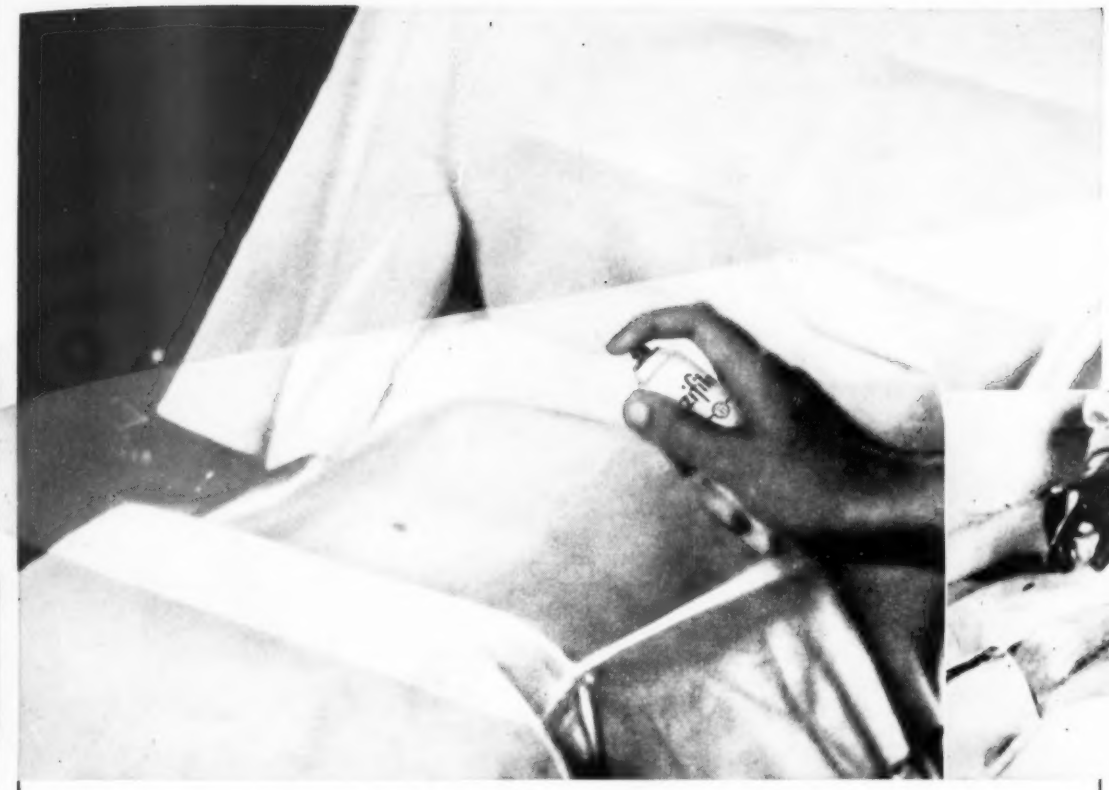

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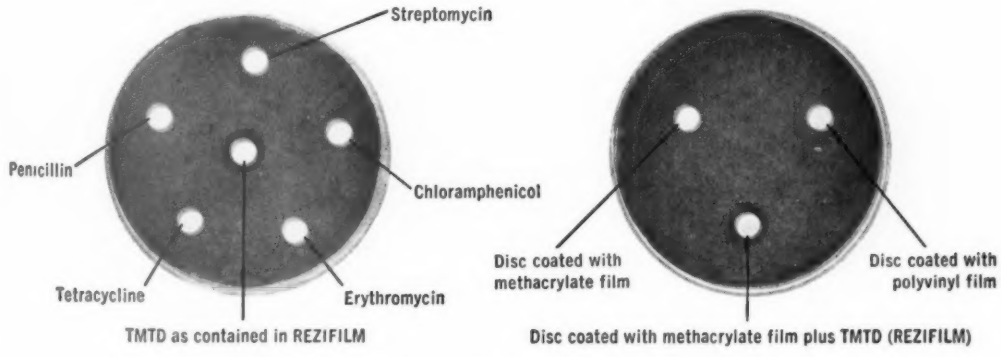

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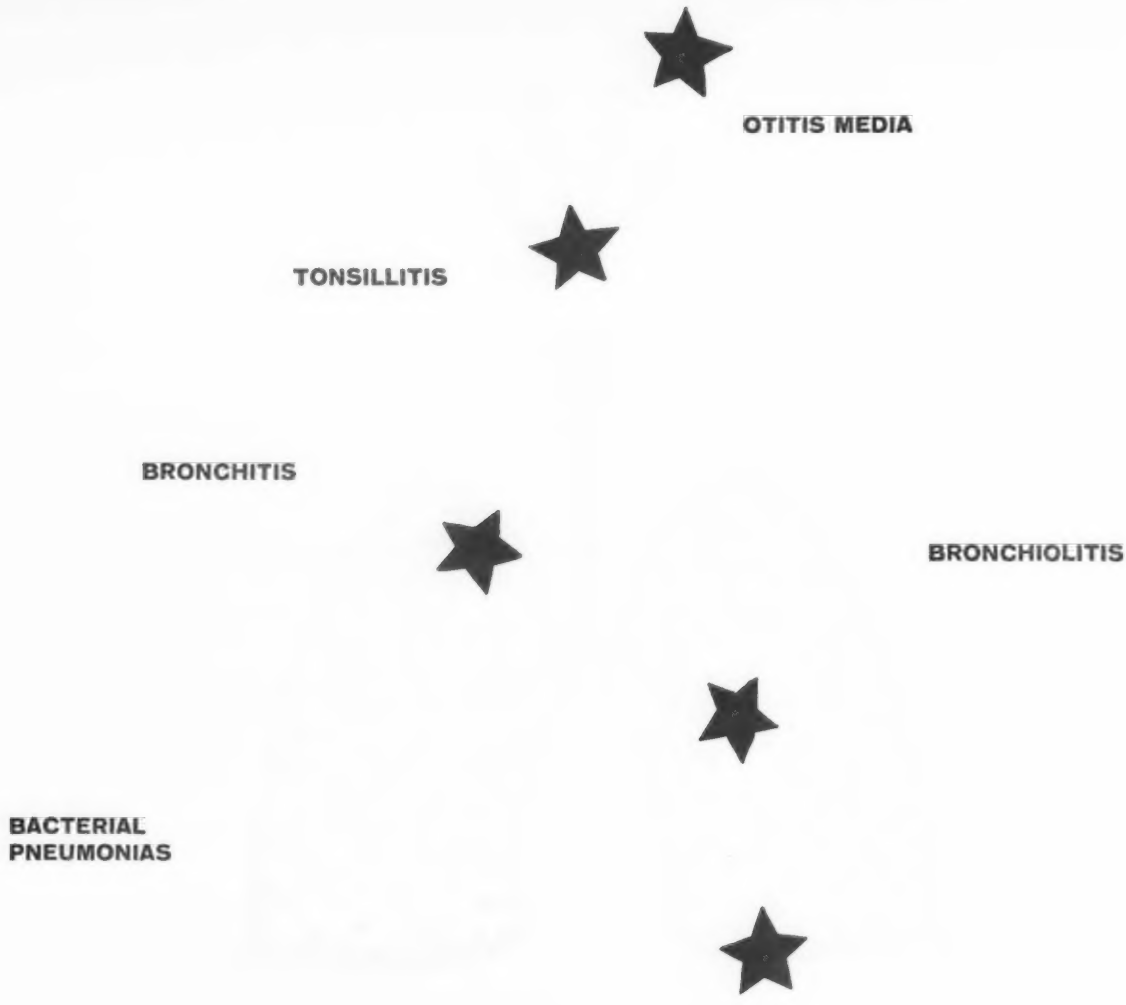

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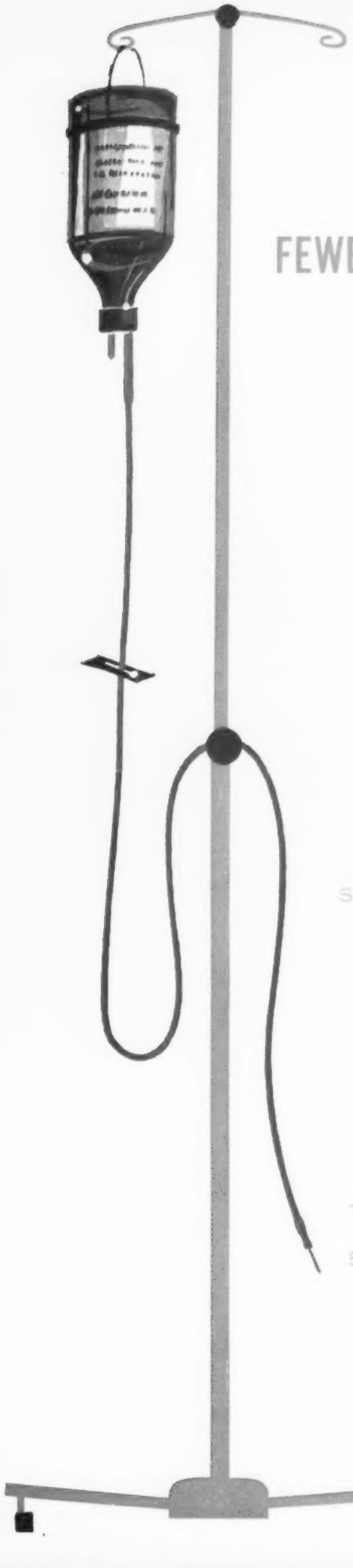

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2.5 mg. (s.c. yellow) ; bottles of 50

SYRUP . . . 2.5 mg. to each 5 cc. (1 teaspoonful); 4 oz. bottles

1. 1958 Report of American Red Cross Joint Blood Council
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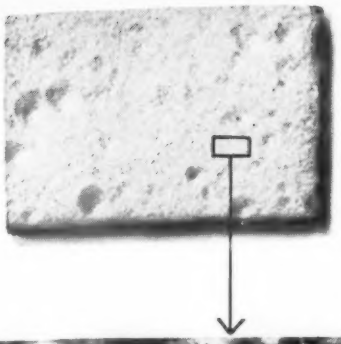
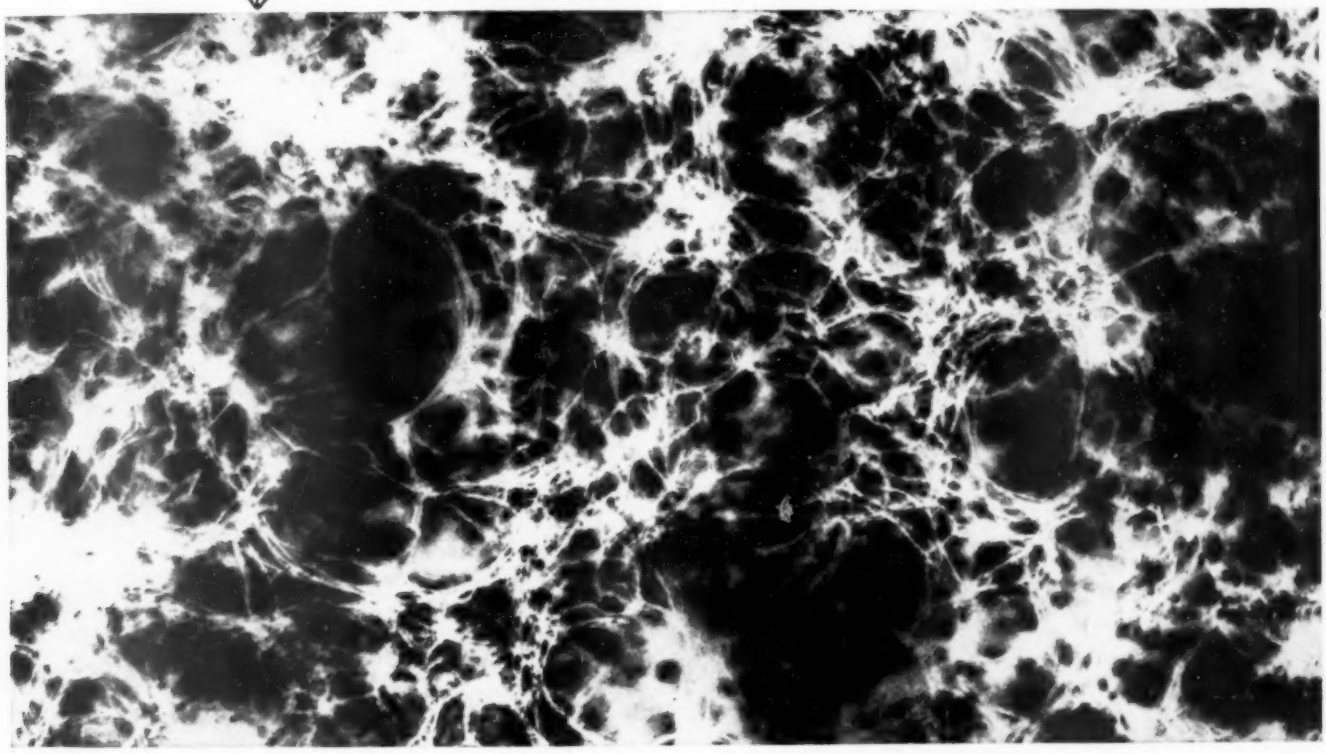


here blood
enters . . .
stops . . .
clots . . .

Cross section of Gelfoam magnified 50 times



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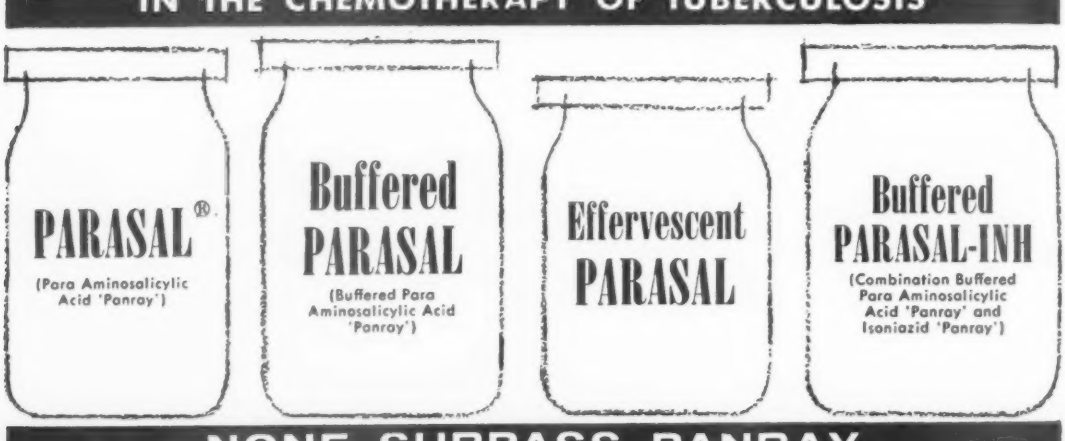

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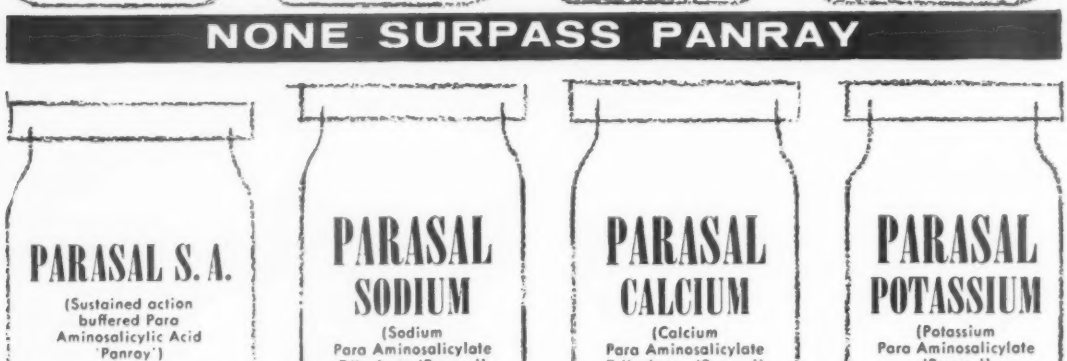

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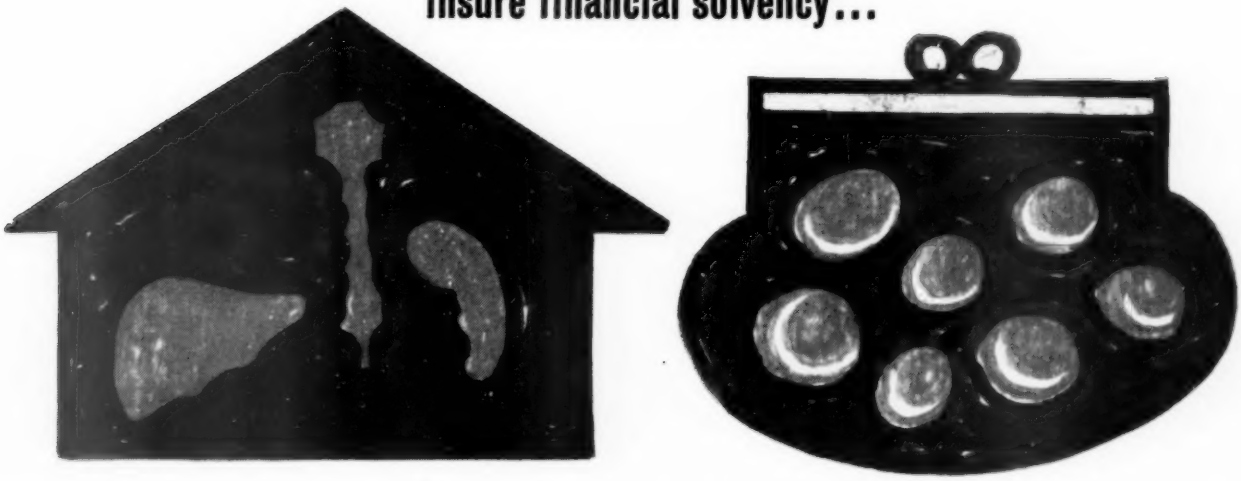

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(1) Holly, R. G.: Postgrad. Med. **26**:418, 1959. (2) Evans, L. A. J., in Wallerstein, R. O., and Mettier, S. R.; Iron in Clinical Medicine, Berkeley, Univ. California Press, 1958, p. 170. (3) Schwartz, L.; Greenwald, J. C., and Tendler, D.: Am. J. Obst. & Gynec. **75**:829, 1958.

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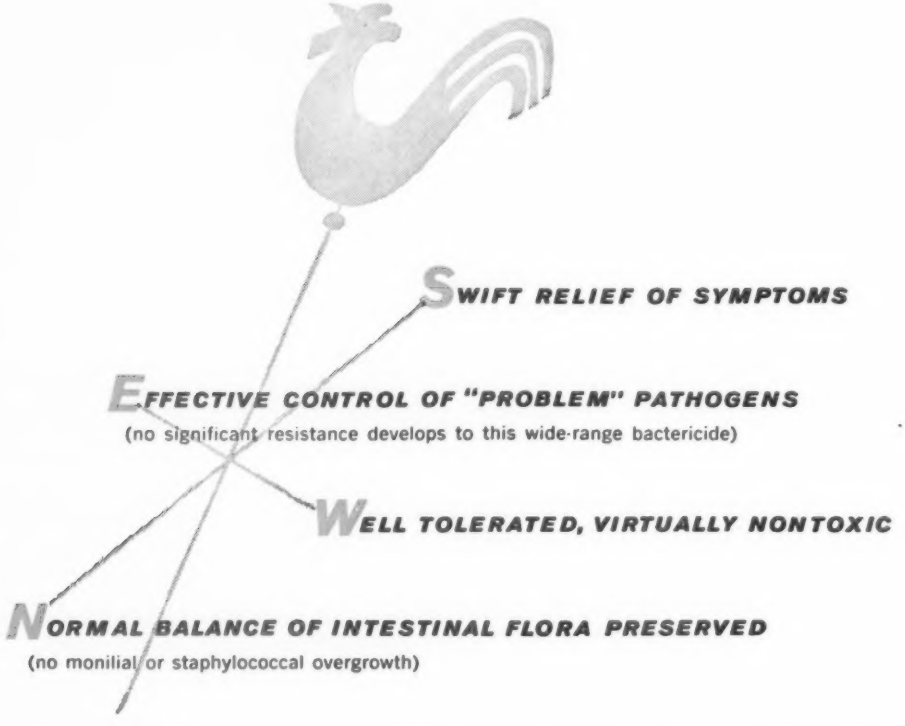
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1. Kareha, L. G., de Quevedo, N. G., Tighe, P., Kehrli, H. J., "Evaluation of Ilopan in Postoperative Abdominal Distention," Western J. Surg. Obs. & Gyn., 66:220, 1958.
2. Stone, M. L., Schlussel, S., Silberman, E., Mersheimer, W. L., "The Prophylaxis and Treatment of Postpartum and Postoperative Ileus with Pantothenyl Alcohol," Amer. J. Surgery, 97:191, 1959.

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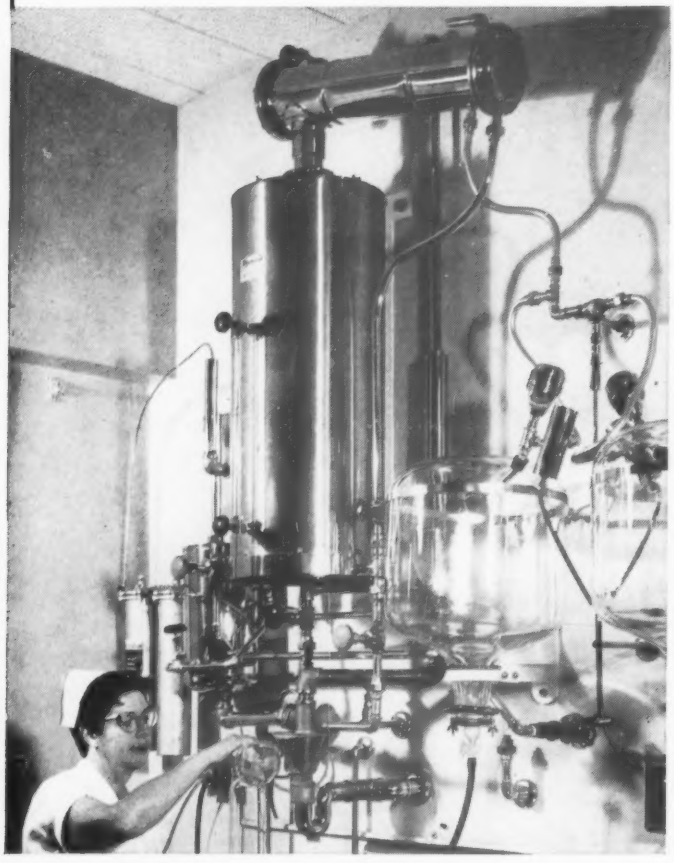

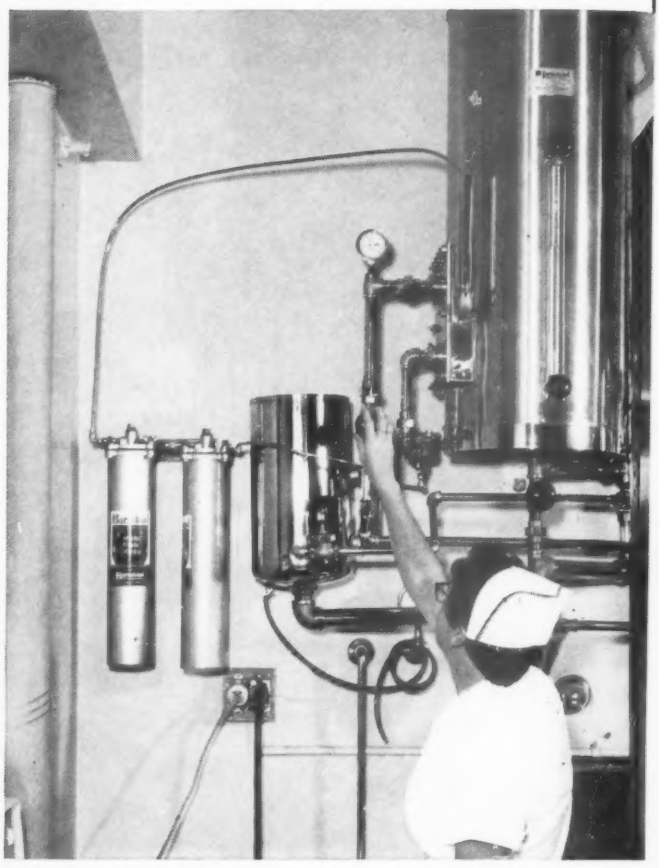

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*Ayd, F. J., Jr.: New England J. Med. *261*:172, 1959.

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Polydipsia	89	81.0
Weight loss	47	42.7
Polyphagia	28	25.4
Anorexia	16	14.5
Lethargy	14	12.7
Enuresis	7	6.4
Vomiting	5	4.5
Irritability	3	2.7
"Craving for sweets"	3	2.7
"Sticky diaper"	3	2.7
"Strong odor to urine"	2	1.8
Glycosuria	2	1.8
Hypoglycemia	2	1.8
Personality change	1	0.9
Boils	1	0.9
Headache	1	0.9
Abdominal cramps	1	0.9

Adapted from Traisman, H. S.; Boehm, J. J., and Newcomb, A. L.*

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1. Moser, K.M.: J.A.M.A. *167*:1695 (Aug. 2) 1958
2. Cliffton, E.E.: J. Am. Geriatrics Soc. *6*:118, 1958
3. Sussman, B.J., and Fitch, T.S.P.: J.A.M.A. *167*:1705 (Aug. 2) 1958
4. Singher, H.O., and Chapple, R.V.: Clin. Med. *6*:439 (March) 1959

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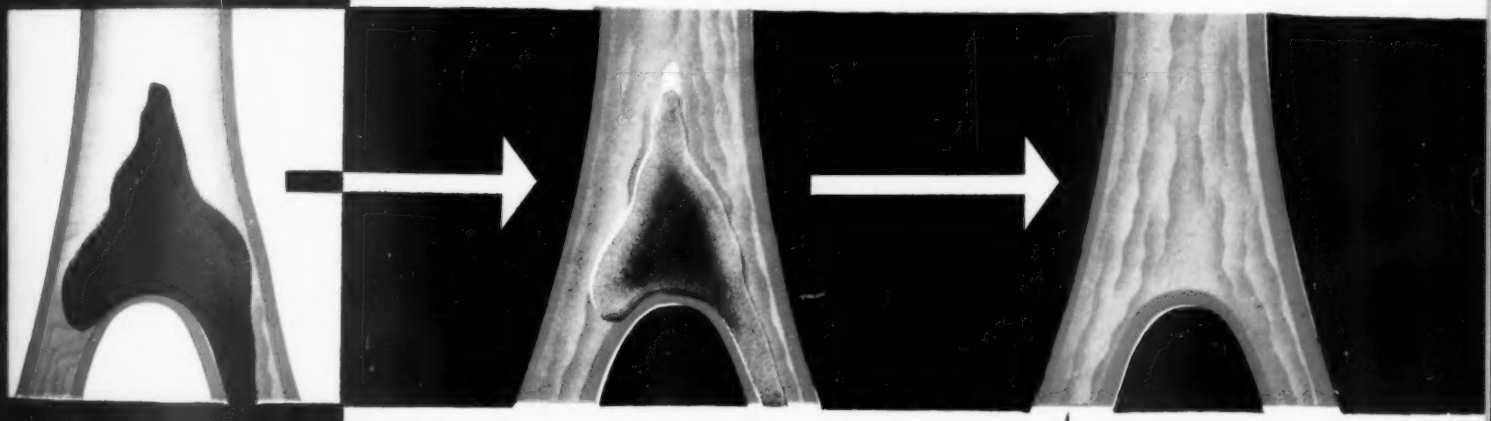
in thrombophlebitis and pulmonary embolism



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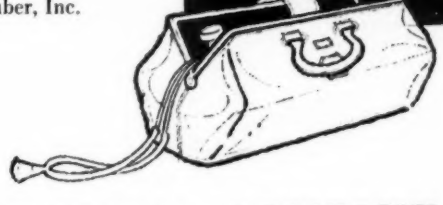

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Arizona Society

The January 17 meeting of the Arizona Society of Hospital Pharmacists was held at St. Luke's Hospital in Phoenix. Topics discussed included the awarding of a United States Dispensatory to a Junior Student at the University of Arizona College of Pharmacy, and methods of initiating acceptance and use of the *American Hospital Formulary Service* in hospitals.

Northern California Society

The 135th regular meeting of the Northern California Society of Hospital Pharmacists was held at the Alta Bates Community Hospital, Berkeley, on February 9.

Mr. Jerome M. Yalon, Associate Administrator of the University of California Medical Center and a former hospital pharmacist, spoke on "Progressive Care in Hospital Management." He developed his subject along three broad areas of patient care, namely, Intensive Care, General Nursing Care, and Minimum Care. The basis for the Progressive Care system is to more equally apportion the cost of hospital care on the basis of required services, particularly nursing service. Expanding his topic, Mr. Yalon mentioned that other "Progressive Care Zones" of the future might include Continuing Care (for orthopedic, cardiac, or terminal patients), Home Care, and Hotel-type Care for diagnostic patients. Mr. Yalon emphasized two rewards of this system—reduce costs for the average patient; and raise the level of medical care for those who require it the most.

During the business portion of the meeting, Mr. Claude Busick, a past President of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, gave a report on the Northern California Pharmaceutical Association Convention in Sacramento.

Colorado Society

The annual banquet for the installation of officers for the Colorado Society of Hospital Pharmacists was held on January 19 at the Cosmopolitan Hotel in Denver.

Mr. Thomas Madden, acting as Master of Ceremonies, introduced the special guests for the evening, Mr. Richard McLeash, Executive Secretary of the Colorado Hospital Association, and Mr. Phillip Houtz, Executive Director of the National Jewish Hospital.

Officers installed were *President*, Joseph C. LaNier (re-elected); *Vice-President* Irvin Friesen; and *Secretary* Margie Gaasch (re-elected).

Mr. Irvin Friesen, on behalf of the Colorado Society, presented a copy of the *American Hospital Formulary Service* to the College of Pharmacy of the University of Colorado.

Illinois Society

The regular meeting of the Illinois Society of Hospital Pharmacists was held at the St. Clair Hotel in Chicago on February 9. The program included a panel discussion entitled "Hospital Central Service: Who Can Better Provide This Service." Those serving on the panel included Mrs. Eva Buckingham, Director of Central Service of the University of Chicago Clinics; Miss Mary Helen Anderson, Director of Personnel of Little Company of Mary Hospital and Central Service Editor of *Hospital Management;* Mr. Al Nollau, Assistant Director of Pharmacy Service, University of Chicago Clinics; and Mr. William T. Middlebrook, Jr., Associate Director of Hospital Counseling Program of the American Hospital Association. Mr. Middlebrook represented hospital administration and served as the moderator of the panel.

Mr. Joe Oddis gave a summary of the discussion, and made the suggestion that a short course be given to train the person who is to direct central service.

Maryland Association

The February meeting of the Maryland Association of Hospital Pharmacists was held at the National Naval Medical Center, Bethesda, Maryland, on February 18.

Mr. Raymond Dauphinais, Director of the Legal Division of the American Pharmaceutical Association, was the guest speaker for the evening. The meeting consisted of a discussion of the legal problems confronting hospital pharmacists and how the newly constituted Legal Division of the American Pharmaceutical Association will benefit hospital pharmacists.

Minnesota Chapter

The regular meeting of the Minnesota Chapter of the American Society of Hospital Pharmacists was held at St. Barnabas Hospital in Minneapolis on January 16.

The forthcoming Hospital Pharmacy Institute which is to be held in Minneapolis was the first subject discussed. The Institute will be held August 1 through August 5, 1960. A tentative program and plans for the Hospitality Committee were discussed.

A membership drive was started at this meeting, with a goal of 100 percent membership of the hospital pharmacists in Minnesota. At present there are approximately 58 percent of the pharmacists who are members of the parent organizations and the local Society. In addition, the Society hopes to have 100 percent representation in the Minnesota State Pharmaceutical Association.

Mississippi Society

The regular quarterly meeting of the Mississippi Society of Hospital Pharmacists was held on January 13 at St. Dominic-Memorial Hospital in Jackson.

The first speaker of the afternoon was Dr. David B. Wilson, Administrator of the University Hospital in Jackson. Dr. Wilson spoke on "The Formulary System," evaluating it in general and pointing out the views of the American Hospital Association on the subject. The basic mechanism for implementing a successful formulary program, Dr. Wilson stated, lies in the use of generic names and in the continued dynamic activities of the Pharmacy Committee. An interesting development in Dr. Wilson's talk was the proposal that the Pharmacy and Therapeutics Committee conduct a therapeutic audit of patient records, similar in nature to the function of the Tissue Committee in hospitals.

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Dr. William C. Holland, Professor and Chairman of the Department of Pharmacology at the University Medical Center, was the second speaker. Dr. Holland spoke on "Rational Therapy." He placed particular emphasis on three points in his presentation—the danger of over-medication; the wisdom that "Mother Nature" should have a chance to effect cures; and the formulary system fosters more rational drug therapy.

Greater Kansas City Society

The Society of Hospital Pharmacists of Greater Kansas City met for its regular meeting on January 4. Special guests at this meeting were the Directors of Nursing from several of the local hospitals.

Additional plans for the Pharmacy Section of the Midwest Hospital Association Convention were discussed. A varied program has been arranged, with speakers from different fields representing the pharmaceutical industry and professional pharmacy participating.

Following the business meeting a film sponsored by Merck Sharp and Dohme was shown, entitled "Your Family Doctor's Notebook."

Greater New York Chapter

The Greater New York Chapter of the American Society of Hospital Pharmacists held its regular meeting on February 16 at the New York Foundling Hospital.

Dr. Alfred Vignec, Director of Pediatrics at St. Vincent's Hospital, New York City, and New York Foundling Hospital, was guest speaker for the afternoon. His topic, "The Use of Parenteral Fluids in Pediatrics," was a comprehensive presentation illustrating the fundamental concepts of fluid and electrolyte therapy in infants. His talk gave many points to be used as practical guides as to the type of solutions to be stocked.

Western New York Chapter

The regular meeting of the Western New York Chapter of the American Society of Hospital Pharmacists was held at the Buffalo Children's Hospital on January 26.

The speaker for this meeting was Mr. Moir Tanner, Administrator of Children's Hospital. He spoke on the responsibilities of the pharmacist in the administrative organization, and the reciprocal responsibilities of the administration to the pharmacist.

In February the Western New York Chapter held a dinner meeting at the Sheraton Hotel in Buffalo. Special guests at this meeting were the members of the Western New York Hospital Council. Following the dinner, Mr. Alfred Mannino, Director of the Hospital Department for McKesson and Robbins gave a talk on "Hospital Inventory Control."

North Carolina Society

The North Carolina Society of Hospital Pharmacists held its regular quarterly meeting on January 30 at the Barrington Hotel in Charlotte. Preceding the regular business meeting the following officers for the new year were installed: *President* Gerald Stahl, Watts Hospital, Durham; *Vice-President* Margaret Gretz; and *Secretary-Treasurer,* Frank Lowder. The installing officer was Mr. Tom Collier.

North Dakota Society

Affiliation of the North Dakota Society of Hospital Pharmacists with the ASHP was announced at the February 13 meeting in Fargo. ASHP President Vernon O. Trygstad participated in the meeting and officially announced the affiliation which had only recently been approved by the ASHP Executive Committee. He welcomed the group as an affiliate of the national organization and urged participation in activities on both the national and local level.

The North Dakota Society was organized in 1955 and was formally accepted for affiliation by the ASHP Executive Committee meeting in early February 1960. Officers of the North Dakota Society for 1960 are *President* Sister Emmanuel, O.S.B., St. Alexius Hospital, Bismarck; *Vice-President* Frederick B. Winter, St. Luke's Hospital, Fargo; and *Secretary-Treasurer* John Jacobson, Bismarck Hospital, Bismarck.

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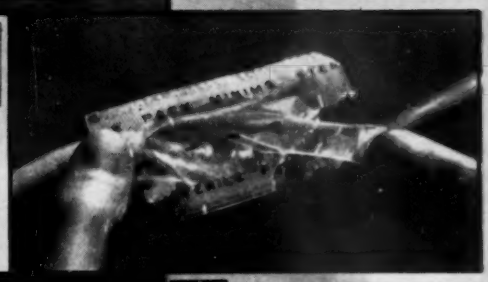
Members of the North Dakota Society meeting in February. President Vernon O. Trygstad is shown on extreme right (standing)



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This was the official semi-annual meeting which was held in connection with a Seminar of the North Dakota Society. Speakers on the Seminar program included Mr. Charles Nesbitt and Mr. Robert Harding who presented a discussion of "Pharmacy Records and Reports." Another paper entitled "Job Descriptions," was presented by Mr. Gene Bakke. Concluding the program was a symposium on "Resident and Intern Programs in Hospital Pharmacy."

Akron Area Society

The February 16 meeting of the Akron Area Society of Hospital Pharmacists was held at the Salem City Hospital.

The meeting was primarily devoted to a discussion of plans for the Student Visitation Project. This is a two-day affair, to which pharmacy students from nearby schools of pharmacy are invited to visit hospitals and attend a meeting of the Akron Area Society. Expenses for the project are borne by the Society.

Other topics discussed at this meeting were Liability Insurance and the new Welfare Board Regulations.

Cleveland Society

The regular meeting of the Cleveland Society of Hospital Pharmacists was held on February 24 at the Lutheran Hospital in Cleveland.

Mr. Rudolph Lukez gave a report on a meeting held with the Cleveland Academy of Pharmacy on February 17. The use of generic names was the principal topic for discussion at this meeting.

Dr. Marvin Rollins, guest speaker, discussed "Nuclear Medicine." Later the members adjourned to the radiation laboratory in the hospital where they were given a demonstration and a short lecture on the use of the cobalt machine.

Oklahoma Society

The Oklahoma Society of Hospital Pharmacists held its regular meeting on February 25 at St. Anthony's Hospital in Oklahoma City.

Dr. George L. Lythcott, a pediatrician of Oklahoma City, was the speaker for the evening. He spoke on immunization procedures with children, and other uses of the various serums, vaccines, and toxoids.

Western Pennsylvania Society

Mr. James Sandala, Chief Pharmacist at Western Pennsylvania Hospital in Pittsburgh, was installed as president of the Western Pennsylvania Society of Hospital Pharmacists at

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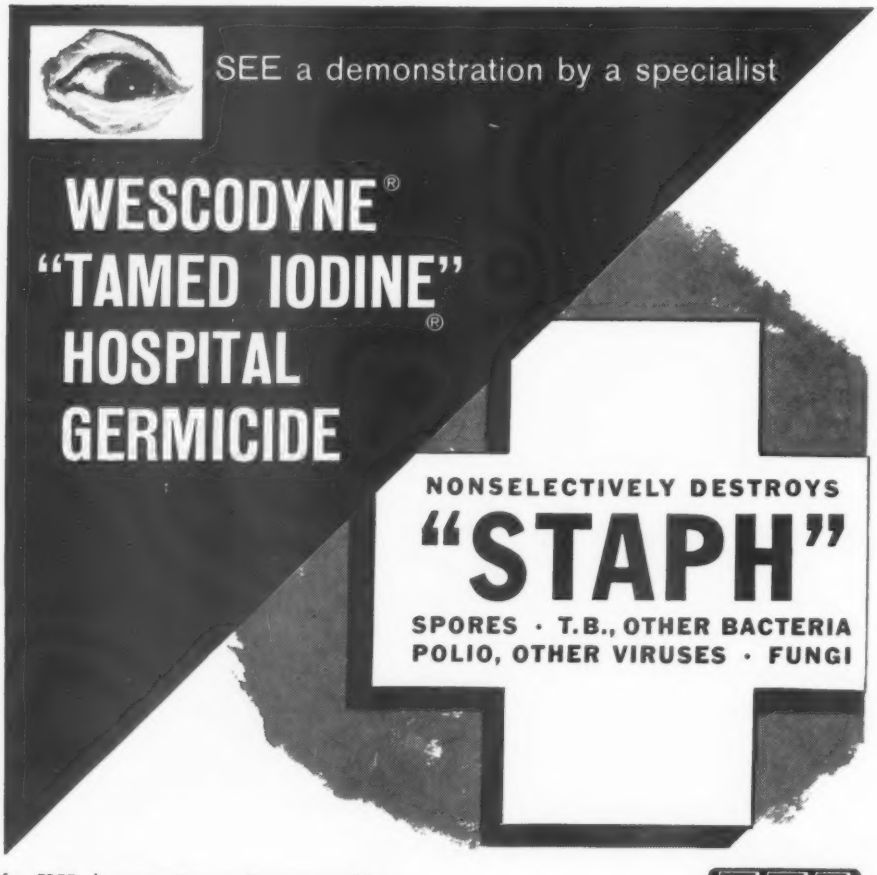

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a luncheon on January 23. Other officers installed at this time were: *Vice-President*, Gerald Wolf, Mercy Hospital, Pittsburgh; *Recording Secretary* Virginia Madden, University of Pittsburgh; *Corresponding Secretary* Anne Marie Peters, Homestead Hospital, Homestead; and *Treasurer* William Sinclair, Allegheny Valley Hospital, Tarentum.

The February 18 meeting of the Western Pennsylvania Society was held at the Oakland Veterans Hospital.

Mr. Gerald Wolf gave a report of the February 2 meeting of the Pennsylvania Hospital Pharmacy Council and the Pennsylvania State Board of Pharmacy. Topics discussed at this meeting included the interpretation of the term "prior consent," credit for hospital apprentices, and outpatient departments.

Wisconsin Society

The second meeting of the Wisconsin Society of Hospital Pharmacists for the 1959-1960 year was held at the Milwaukee Hospital on October 23.

Dr. Derward Lepley was the guest speaker for the evening. He presented a discussion on heart surgery. In developing his subject, Dr. Lepley followed the advances of heart surgery with new techniques and the discovery and development of the oxygenator. He discussed the various type of oxygenators and pointed out the advantages and disadvantages of each one. Dr. Lepley emphasized the importance and value of team work in heart surgery; some of the teams have practiced together in laboratories for over two years.

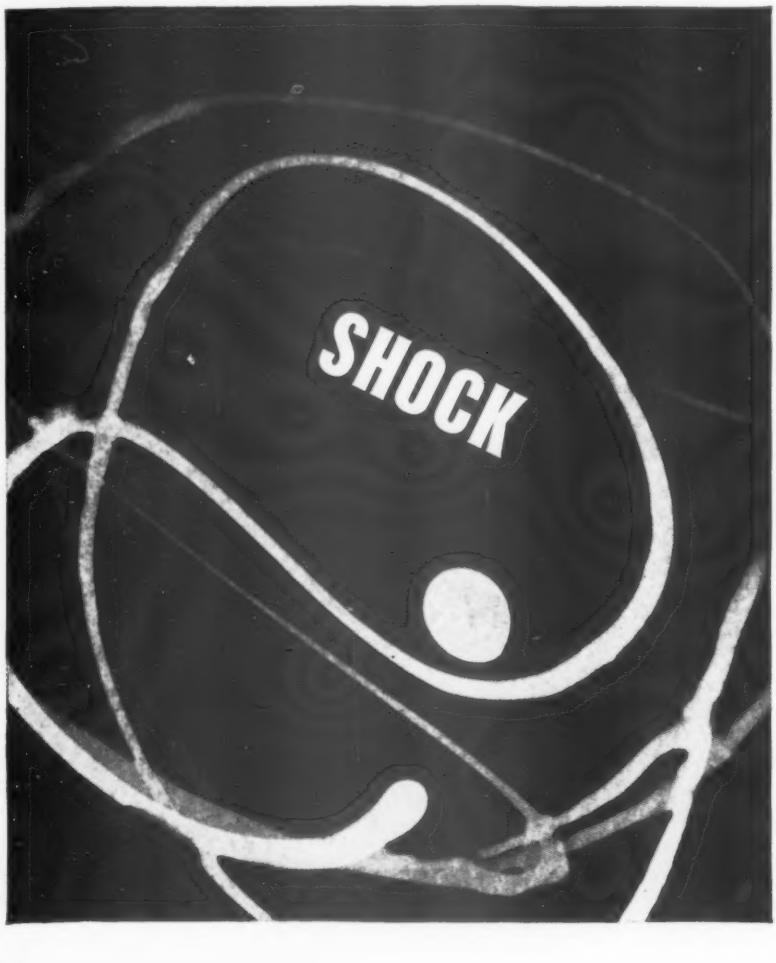
In the business meeting which followed, announcement was made of the Pharmacology Lecture series to be given at the University of Wisconsin in March.

A report from the Constitutional Revision Committee listed the changes proposed in the Constitution and By-Laws. These changes will be studied and voted on at a future meeting.

Dr. Ruben Beezy of the Veterans Administration Hospital, Wood, Wisconsin, was the speaker at the January meeting of the Wisconsin Society of Hospital Pharmacists, held at Marquette University Dental School.

Dr. Beezy's topic, "Current Therapy in Antibiotic Use," discussed some of the lesser known facts about the more common agents and also some of the newer antibiotics and chemotherapeutic agents. The open discussion from the floor following the presentation answered many questions regarding therapy and side effects of the drugs.

Secretaries of ASHP Affiliated Chapters are urged to send reports of meetings to the national secretary promptly. Since the AMERICAN JOURNAL OF HOSPITAL PHARMACY appears on a monthly basis, reports must be received within five days after the meeting in order to be included in the forthcoming issue. We urge you to send details of the activities of your chapter for publication in this column.



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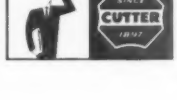

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Southern California Seminar

► A HOSPITAL PHARMACY SEMINAR, presented as a "Clinical Approach to the Solution of the Problems of Hospital Pharmacy," will be conducted at the University of Southern California on Saturday and Sunday, May 28 and 29. The meeting will be presented by the U.S.C. School of Pharmacy coordinated with the Southern California Society of Hospital Pharmacy.

An interesting and educational approach is promised by holding a series of clinics on each of the major divisions of the problems encountered by hospital pharmacies. Each clinic will be conducted by a leader, using several authorities or specialists and hospital pharmacists familiar with the problem. Considerable care is being given so that the problems of hospitals of all classifications will be covered. The program schedule, under the title "A Clinic on Pharmacy Operations," is as follows:

Saturday Morning Session

Wendell T. Hill, Jr., Chairman

Registration—Welcome and Announcements.
8:30— 9:00

First Clinic—PHARMACY PLANNING AND ORGANIZATION.
9:20—10:40 Clinic Leader, Joseph H. Beckerman, Chief Pharmacist, U.C.L.A. Problems in this clinic concern Hospital Policy, Laws, Scope of Service, Therapeutic Committee and Formulary, Inter-departmental Relations, and Teaching Responsibilities.

Second Clinic—DISPENSING METHODS AND PROBLEMS.
11:00—12:00 Clinic Leader, Margaret H. Kulik, Chief Pharmacist, Queen of Angels Hospital, L.A.

Inpatient and Outpatient Dispensing, including a discussion of Individual Prescriptions versus Floor Stock and their Controls, and the Needs for 24-Hour Service, will be considered.

Luncheon on the campus
12:00— 1:30

Saturday Afternoon Session

Charles G. Towne, Chairman

Third Clinic—SPECIAL PROBLEMS.
1:30— 3:00 Clinic Leader, Wendell T. Hill, Jr., Chief Pharmacist, Orange County General Hospital, Orange.

Experts in the fields of Narcotics, Hypnotics, and Alcoholics, Accountability, and Control of Investigational Drugs, will participate in these areas.

Fourth Clinic—BUSINESS OPERATIONS.
3:20— 5:00 Clinic Leader, Louis J. Motta, Pharmacy Manager, Kaiser Foundation Hospitals, Southern California.

Records and Reports, Efficient Purchasing, Pricing and Charging, and Budgets, will be covered by hospital pharmacists and an administrator familiar with the problems.

Sunday Morning Session

Jack S. Heard, Chairman

Fifth Clinic—STERILIZATION PROBLEMS.
9:30—11:00 Clinic Leader, Chester A. Bazel, Section Chief Pharmacist, V.A. Center, L. A. Technics of Sterilization of Pharmaceuticals, such as Ointments, Ophthalmics, and Irrigating Solutions, as Related to Routine Hospital Needs, will be presented, with consideration for other sterilizing problems, such as instruments, thermometers and gloves outside of the pharmacy.

11:00—11:30 Film

Sixth Clinic—LABORATORY DEMONSTRATION OF HOSPITAL EQUIPMENT.

11:30—12:30 Clinic Leaders, Professors Crowell and Miller, U.S.C., School of Pharmacy.

Luncheon at Rudi's Restaurant.

1:00— 3:00 The speaker will be Orville N. Booth, President of the California Hospital Association and Administrator of St. Francis Memorial Hospital, San Francisco.

The Society is arranging a concurrent dinner on Friday evening, May 27. The speaker will be Vernon O. Trygstad, President of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS.

The Clinic Leaders will introduce the subject to be covered, outlining the problems and calling upon the authorities and clinic members present to further discuss and resolve their special problems.

Participants will include such authorities as Vernon O. Trygstad, President of the ASHP and Director of Pharmacy Service of the Veterans Administration, Washington, D.C.; Jack Heard, Vice-President of the ASHP and Director of Pharmacy Services, St. Francis Memorial Hospital, San Francisco; Charles G. Towne, active in the nationwide SOCIETY activities and Chief of Pharmacy Services at the Veterans Administration, West Los Angeles; Wendell T. Hill, Jr., President of the Southern California Society of Hospital Pharmacists and Chief Pharmacist, Orange County General Hospital; Joseph H. Beckerman, Chief Pharmacist, U.C.L.A.; Dean Alvah Hall of the U.S.C. School of Pharmacy, supported by his faculty; and members of the State Board of Pharmacy; state or federal Narcotic Divisions; local hospital pharmacists and students will present carefully prepared discussions of problems of their particular interest.

Administrators are urged to send or encourage their pharmacists to attend the Seminar. It is open to all hospital pharmacists, and a special invitation is extended to hospital administrators to attend.

Registration fee for the two days, including the Sunday luncheon, is $15.00. Applications are being mailed to hospitals and their pharmacists.

One of the principal aims of this meeting is to raise money to create a fund to be known as the "Sister Junilla Hospital Pharmacist Scholarship Fund." Gratitude is expressed to everyone for working so hard to also make this Seminar a worthy educational opportunity for western hospital pharmacists.

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1. Garnes, A.L., et al.: Am. J. Surg. 37:43, 1961

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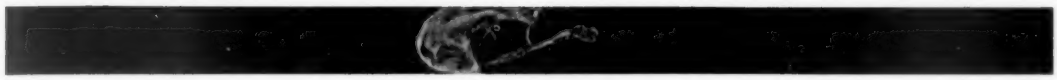

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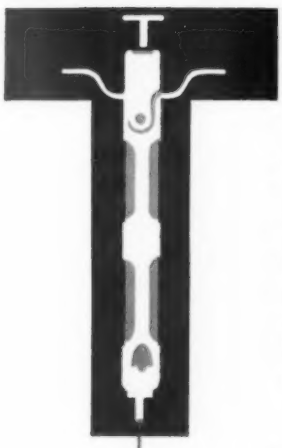

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staph newsletter

FIFTH OF A SERIES WITH SIGNIFICANT SUGGESTIONS FOR CONTROLLING CROSS INFECTION

WHILE this letter is being written, reports are increasing on the occurrence of flu and flu-like illnesses leading rapidly to staphylococcal pneumonia and ending in death. By the time you are reading this, influenza may have become truly epidemic or it may have started a seasonal downtrend. But with its already wide national spread mentioned in USPHS-HEW Morbidity and Mortality Reports as breaking out from Hawaii to British Honduras—we all realize no precautions can be too stringent. Since it is known that influenza virus persists for days in a virulent form in the environment, intensive disinfection is an essential preventive measure.

"Infections have occurred that nothing known to medical science at present time will cure. There is also evidence accumulated to show the same trend in some other bacteria, especially some of the gram-negative bacilli found in the urinary tract. Our problem, though simple, is a big one and we have just begun to fight back. These staphylococcal infections manifest themselves by wound infections, furunculosis, pneumonia and enteritis. The first two are our concern because they are sources of spread of the organisms and the last two are vicious in their assault on human life. The pneumonia and enteritis may kill quickly and surely in one to three days." Arnold W. Lempka, M.D.: Nebraska State Medical Journal, October, 1959.

In the matter of aseptic housekeeping of the operating room, Dr. Lempka recommends that "no dusting should be allowed. A wet scrub or washdown is in order."

Tergisyl®, Lehn and Fink's combined phenolic disinfectant and detergent, is being used widely and effectively for flooding floors and washing down all equipment and surfaces in the operating room. Dr. Ralph Adams, Chief of Surgery at Huggins Hospital, Wolfeboro, N. H., has reported disinfection with Tergisyl as an integral part of his established system for controlling infection in the O.R. The infection rate was reduced from 2% to .25%. If you would like reprints of Dr. Adams' article from the American Journal of Nursing (August, 1959), please let us know.

The importance of "The Committee on Infections" has occasionally been discussed by us on this page, or in other L&F communications to our hospital friends. Generally, we have assumed that you had a committee continually evaluating the staph problem and we have offered any assistance or information you might find useful from our long experience in developing efficient disinfectants for hospital use. In his Hospital Management article on infections committees, Dr. Charles U. Letourneau has some interesting suggestions. As those of us who know Dr. Letourneau would expect, the article pulls no punches and calls a spade a spade but, as we would also expect, the recommendations are well founded and documented. You'll find it on page 37 of the February, 1960, issue.

Successful reduction of staphylococcal infection in a 28-bed male surgical ward at the British Royal Infirmary is reported in The Lancet for November 7, 1959, page 781. Infection rate had been 40% on open wounds, with 3.3% considered significant because of such complications as pneumonia, urinary tract infection, parotitis, enterocolitis, furunculosis, and wound sepsis originating at operation. Introduction of a combination of preventive measures, closely studied for two years, resulted in appreciable reduction in staph infection, not only in the ward but in O.R. infections in patients from the ward. Among precautions followed were: disinfection of blankets and pillows, disinfection of dishes and cutlery, use of germicidal hand cream by nurses, disinfection of the ward barber's shaving brushes and razors, disinfection of bathtubs.

Increased use of the term "contamination control program" by hospitals who have begun by concentrating on staph infection control, brings us again to some other organisms which need control. For instance, the Journal of the American Medical Association (January 23, 1960, page 329) has a detailed report on a case of postoperative endocarditis due to Pseudomonas aeruginosa. In this case, recovery followed reoperation and long convalescence but the source of infection was never determined. Other articles are mentioned reporting similar infections following heart surgery, most of which ended fatally. Bacteremia following cardiac catheterization was reported in the June 4, 1959, issue of the New England Journal of Medicine. Studies of the source revealed that disinfection had been attempted with substances inadequate to kill the virulent, resistant Pseudomonas aeruginosa inside the catheters.

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Dear Sirs:

From The American Association of Poison Control Centers

DEAR SIRS: Among the cases of acute accidental poisoning that are treated at poison control centers, or that lead to requests for information from those centers, one group usually predominates numerically. This category comprises those incidents resulting from the ingestion of medications that are found in the home by children under five years of age, and that are swallowed without the knowledge of their parents or guardians.

A major objective of The American Association of Poison Control Centers is the encouragement of any activity that will prevent accidental poisoning. Toward this end, the members of the Association who attended its Second Annual Meeting in Chicago on October 6, 1959 adopted the following resolution:

Resolved that this organization go on record as favoring the further development of safety closures for all drugs, proprietary and non-proprietary, and that a copy of this resolution be sent to all interested groups.

We are sure that the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS is also interested in measures that will reduce the incidence of poisonings among young children who unwittingly ingest massive overdoses of drugs. Therefore, I have been instructed by the President of The American Association of Poison Control Centers to inform you of the adoption of the above mentioned resolution by the AAPCC.

ARTHUR S. BLANK, *Secretary-Treasurer*

The American Association of Poison Control Centers
Connecticut State Department of Health
Poison Information Center
Hartford 15, Connecticut

Author's Correction

DEAR SIRS: We were pleased to see the article entitled "The Retrobulbar Injection of Lidocaine (Xylocaine) for Anesthesia" which appeared in the March issue of the JOURNAL. I would like to call your attention to an error in the title of one of the authors, Dr. David S. Johnson. He should be listed as "Staff Ophthalmologist, Metropolitan Hospital, Detroit."

Thank you for noting this in a future issue of the JOURNAL.

EDWARD SUPERSTINE, *Chief Pharmacist*

Metropolitan Hospital Clinics
Detroit, Michigan

Correction

DEAR SIRS: In the January issue of the AMERICAN JOURNAL OF HOSPITAL PHARMACY appeared an article entitled "Soviet Views and Plans About Establishing an Efficient System of Pharmaceutical Information" written by Herbert Zacek. This is a very interesting article about the availability of information for the pharmacy. In displaying two pieces of literature on page 33 I noticed that one of the publications, namely *Arhiv Za Farmaciju*, is actually from Belgrad, Yugoslavia.

I hope that the author did not try to mix them up.

RUDOLPH F. LUKEZ

Cleveland Clinic Hospital
Department of Hospital Pharmacy
2050 East 93rd Street
Cleveland 6, Ohio

EDITOR'S NOTE: No, the author did not mix up the illustrations used in the article mentioned above. The editor used, for illustrative purposes, two journals printed with the cyrillic alphabet, knowing that only one of them was Russian.

Appreciation to Division of Hospital Pharmacy

DEAR SIRS: I want to let you know that we have been successful in filling our position of Chief Pharmacist. As you are aware, the man we chose to fill the position was listed with your service. We corresponded with several other of your applicants and were very pleased with the caliber of men who are now available for such positions.

Your fine cooperation has been sincerely appreciated. There is no question but that you offer a real service to the hospitals of this country. Personally, I was not aware of this service before our recent need. I will be one of your most loyal boosters in the future.

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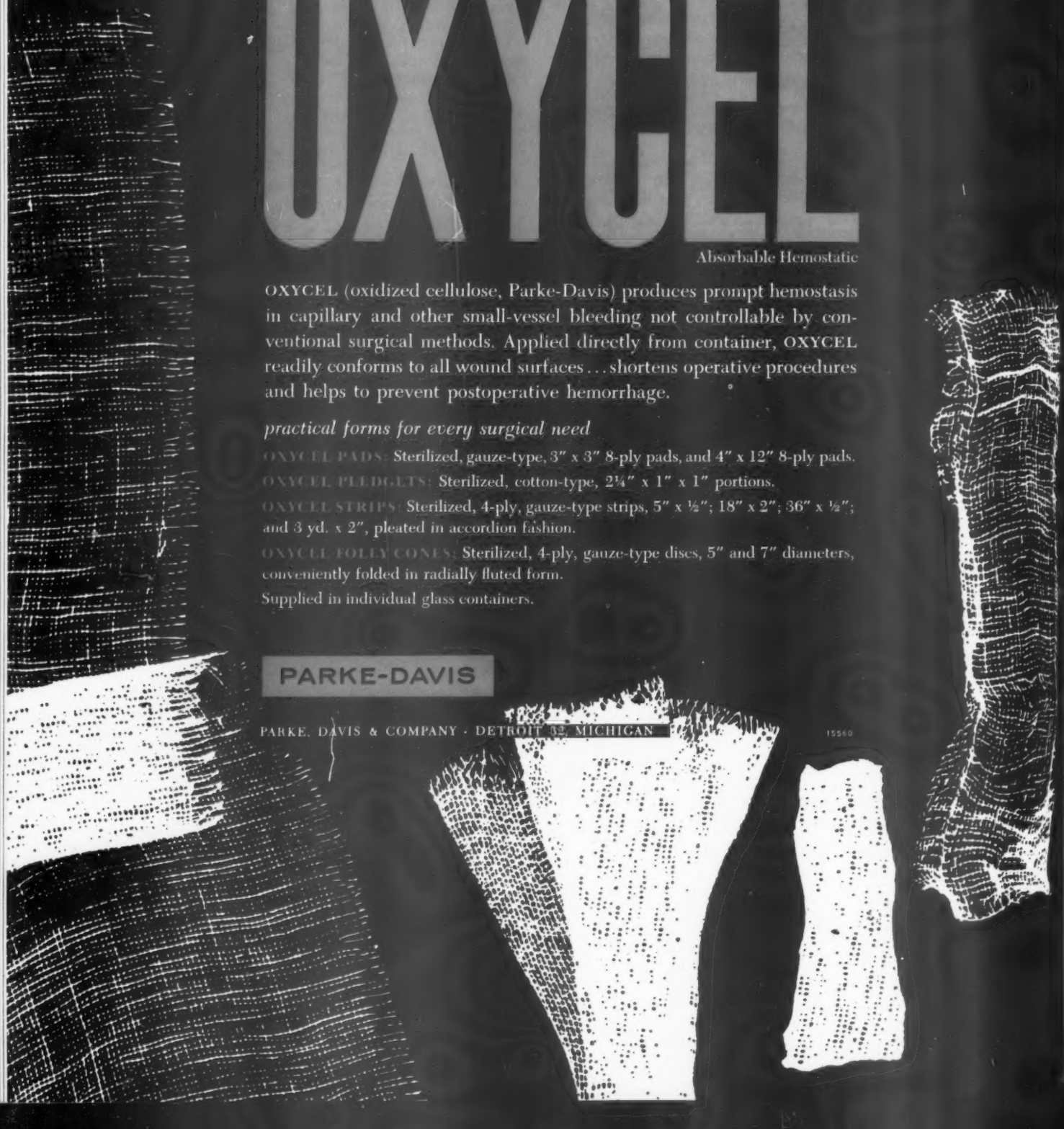

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editorial

by DON E. FRANCKE

United States Pharmacopeia

Fifteenth Decennial Convention

► MEMBERS OF THE FIFTEENTH DECENNIAL U.S.P. Convention met in Washington, D. C. March 29 and 30, 1960 to review the record of the past decade, to elect the Board of Trustees and the Committee of Revision for 1960-1970, and to consider numerous reports and suggestions relative to the problem and needs of the U.S.P. for the coming decade.

Distribution of copies of U.S.P. XVI to members of the Revision Committee symbolized the accomplishments of the past decade, a period during which two revisions of the Pharmacopeia were completed under the guidance of Dr. Lloyd C. Miller, Director of Revision.

Election of the Board of Trustees and of the members of the Committee of Revision for the coming decade is one of the most important functions of delegates to the Pharmacopeial Convention. In general, these delegates represent national associations such as the A.Ph.A., A.M.A., A.H.A., ASHP, etc.; colleges of pharmacy and colleges of medicine; state medical and pharmaceutical associations; and certain departments of the Federal Government such as the Veterans Administration, Public Health Service, Army, Navy, etc. These representatives delegate to the Board of Trustees essentially all power and authority relative to the management and control of pharmacopeial matters, although the Committee of Revision retains the right to be heard in certain matters. In general, the Committee of Revision confines itself to scientific and technical details of the text of the Pharmacopeia.

Three hospital pharmacists were elected to office during the Convention. Dr. George F. Archambault, Liaison Officer to the Surgeon General of the U. S. Public Health Service, was elected a member of the Board of Trustees of the Pharmacopeial Convention. Thus, Archambault becomes the first hospital pharmacist in this century to be so honored and follows the renowned hospital pharmacist, Charles Rice, who so fundamentally influenced the format and content of the U.S.P. during the latter part of the 19th century.

Elected to the Committee of Revision were Mr. Grover C. Bowles, Jr. of Baptist Memorial Hospital, Memphis, Tennessee and Dr. William M. Heller of the University of Arkansas Medical Center, Little Rock, Arkansas.

Dr. Lloyd C. Miller was elected Director of Revision by the Board of Trustees for the coming decade.

Several problems facing the U.S.P. were given consideration during the Convention and referred to the Board of Trustees for consideration. These included: the need for more rapid development and publication of standards so that provisional standards might be available as soon as a drug is marketed; the desirability of including in the U.S.P. such items as orthopedic implants, diagnostic test papers, syringes, etc.; the inclusion of caution statements regarding the stability and storage of drugs; the need for a better public relations program for the U.S.P.; the inclusion of a statement of maximum dosage; the need for the U.S.P. to assume responsibility for developing a program of improved generic names based on principles developed by the World Health Organization; and consideration of a proposal to permit the U.S.P. to utilize the facilities of the A.Ph.A. Laboratory and its publication, *Drug Standards*, in promoting the work of the Pharmacopeia.

The ASHP delegate to the convention pointed out that recent statements by various individuals in pharmacy and allied sciences have implied that drugs of U.S.P. quality and with U.S.P. names are an inferior class of drugs. He emphasized that this impression must be corrected if the U.S.P. is to preserve its integrity and is to continue to receive full acceptance by physicians and pharmacists. In view of the complex nature of the question, the delegate asked that the Board of Trustees be requested to prepare and issue, during the next year, a statement of position regarding the use of U.S.P. names in prescribing drugs of U.S.P. quality.

Thus took place another decennial meeting of the U.S.P. Convention, uniquely the only private corporation which compiles and issues a national pharmacopeia.

EARLY RUSSIAN MILITARY AND NAVAL FORMULARIES

1765-1840

by ALEX BERMAN

Russian Troops as illustrated in James Edward Alexander's "Travels to the Seat of War in the East Through Russia and the Crimea." Volume I, London, 1830

► RUSSIAN MEDICINE WAS DOMINATED BY FOREIGN influences until well into the 19th century; its main development during this period took place under the aegis of the Imperial Court and the military. Garrison has stated that the dependence of Russian medicine on western Europe continued until the advent of Pirogov (1810-1881), Metchnikov (1845-1916), and Pavlov (1849-1936).[1]

The ruthless campaign to westernize Russia which was waged by Peter the Great (1672-1725) affected the course of medicine and pharmacy in his country along with other aspects of Russian life. A military hospital—probably modeled after the naval hospital in Greenwich, England, which Peter had visited in 1698—and a medical school which were established in Moscow by his order (1706-7), were the first real institutions of their kind in the country. Subsequently, Peter had other large hospitals built such as the naval hospital (1716) at the fortress-island of Cronstadt, a "Dry-land" hospital at St. Petersburg, a hospital for invalid soldiers (1715), and a military poorhouse. These institutions were financed through pay deductions from military officer personnel.

A complete revamping of the army medical organization was carried out by Peter in 1716, with a physician and staff-surgeon assigned to each division, a surgeon to each regiment, and a *feldscher* to every company. Two field pharmacies for the entire army were established, one for the infantry and the other for the cavalry. According to Richter, these pharmacies were each staffed with one apothecary, two assistants and four apprentices.[2] Garrison has noted that the army regulations of 1716 also created a Surgeon General and an Apothecary General for the Russian armed forces which then numbered 200,000 regulars and 75,000 Cossacks, and that somewhat similar regulations were promulgated for the navy in 1720, which then comprised "48 warships, 800 smaller craft and 28,000 sailors."[3]

A discussion of Richter's *Geschichte der Medicin in Russland* which appeared in the *British and Foreign Medico-Chirurgical Review* in 1862, included the following observation: "During the whole of the 18th century Russia lay at the feet of a cruel German bureaucracy, which repressed every symptom of national life. The capacity of the native race for science and art was purposely denied . . . In Richter's list of medical men we find scarcely one Russian name until we reach the period of Catherine II."[4] As late as 1875, a delegate from the *Société de Pharmacie de Paris* who had attended the fourth International Congress of Pharmacy in St. Petersburg (1874) remarked that "the larger proportion of Russian pharmacists are of German origin, all their names are either German or Polish. It has been only the last few years that the Emperor Alexander has permitted a true Russian to become a pharmacist."[5]

The Germans were not the only ones who dominated Russian medicine, for French, Dutch and particularly Britons were also represented. "The part played at different periods by Englishmen in the introduction and improvement of medical art in Russia," writes Ravitch, "can scarcely be overestimated."[6] A number of Scottish and English physicians in Russia such as Jonathan Rogers, Sir James Wylie, and Sir Alexander Crichton,[7] played a significant part in the compilation of hospital formularies. It is interesting to point out that the first pharmacy in Russia was established by the English apothecary, James Frencham in 1581.

Bibliographical Note[8]

It is certainly no accident that a military formulary was published for the Russian Armies thirteen years before the appearance of a national pharmacopeia in 1778. This stemmed from the long preoccupation with military medicine and pharmacy, controlled by foreigners, and dating from the time of Peter the Great.

Bearing the impressive title of *Pharmacopoea castrensis continens titulos et descriptiones medicamentorum in cistis chirurgorum qui in exercitu Imperiali Rossico* . . . , the first Russian military formulary was issued under the imprimatur of the Imperial Medical College, and was printed in St. Petersburg in 1765 by the Russian Academy of Science. It was a small work in Latin of 27 pages, with 16 pages of Russian and 14 pages of German explanatory text added. The author of this formulary was Dr. Christian Paeken (1731-1799) who later collaborated with Georg Thomas von Asch (1729-1807) General Staff Physician of the Russian Army in the writing of the first national pharmacopeia of 1778. Born in Hungary, Paeken entered the Russian military service in 1755 as a medical officer assigned to a Division, became Chief Physician of a military hospital in St. Petersburg in 1759, and was admitted a member of the Imperial Medical College in 1763.

Professor Urdang has noted that the early Russian national pharmacopeias "were legally enforced only with limitations," and that it was not until 1866 that a national pharmacopeia was issued which was completely obligatory and "without limitations."[9] A striking feature of some of these early national pharmacopeias is that they contained current official military and naval formularies as supplements. Thus, for example, a reprint of the 1778 pharmacopeia published in 1782 contained the *Pharmacopoea Castrensis Rossica* which had been published by the Russian Academy of Science in 1779. Another reprint of the *Pharma-*

ALEX BERMAN, Ph.D., is Assistant Professor of Pharmacy at the University of Michigan College of Pharmacy, Ann Arbor, Michigan.

copoea Rossica of 1778 issued in 1784, contained both a naval and a military formulary. This latter reprint was translated four year later by Carl Franz Schroeder in Denmark (*Russisches Apothekerbuch; nebst der Russischen Feld-und Schiffsapotheke. Aus dem Lat. von Carl Franz Schroeder.* Copenhagen, 1788, 208 p.).

In 1797, Dr. J.G.D. von Ellisen published his *Pharmacopoea Castrensis* as a 262-page work in Russian which appeared in German five years later under the title of *Russisch-Kaiserliche Feld-Pharmakologie.*

Of the early naval formularies, the most important was undoubtedly Heinrich Bacheracht's *Pharmacopoea navalis Rossica* which was first issued (1783) in Russian as a 39-page work, and then expanded into a Latin version of 60 pages in 1784. Bacheracht's work appeared in the *Pharmacopoeia Rossica* of 1784 and was used in Schroeder's German translation alluded to above. In 1806, Jonathan Rogers, an English surgeon who eventually attained the rank of General Staff-Surgeon to the Russian fleet, published in St. Petersburg a 191-page formulary also entitled *Pharmacopoeia navalis Rossica.* Finally, Scherer and Callisen list a work in Latin of 24 pages which has no date or place of publication and is attributed to Sir Gilbert Blane (1794-1834). Sir Gilbert had attained an international reputation as an authority on English naval medicine, and had acted as a consultant to a number of European rulers, including the Russian Emperor. While this writer has been unable to obtain a copy of this formulary (*Pharmacopoeia Therapeutica in vsum classis Imperatoris totius Russiae*), it may be that it was an adaptation of Blane's *Pharmacopoeia Therapeutica Nautis Accommodata* which takes up pages 585-604 of his classic publication, *Observations of the Diseases of Seamen,* London, 3rd ed., 1799.

No discussion of early Russian military formularies would be complete without mention of an extraordinary figure in the service of Russian military medicine, Sir James Wylie (1768-1854), who for a long time was head of the Army Medical Department in Russia. His military formulary first issued in 1808. Bacheracht's *Pharmacopoea navalis,* and von Ellisen's *Feld-Pharmacologie* will be discussed at some length as representative prototypes of Russian military and naval formularies.

Ellisen's Feld-Pharmakologie

The appearance of J.G.D. von Ellisen's military formulary in the Russian version (1797) and in German translation (1802) marks a significant point in the development of this genre of Russian pharmaceutical literature. By arranging the official list of medications for field pharmacies in a comprehensive monographic series rather than merely as a catalogue of drugs, the author was able to make an important advance. This approach was developed further six years later by Sir James Wylie in his *Pharmacopoeia Castrensis,* a work which doubtless represents the peak in the growth of the early military Russian formulary.

It is not clear why the *Russisch-Kaiserliche Feld-Pharmakologie* was published in Stendal, Prussia, rather than at St. Petersburg, where the Imperial Medical College had authorized and approved this work, and where the Russian Academy of Science had available press facilites. This situation is partly explainable by the fact that Dr. Conrad F. Uden, the editor of this book[10] and possibly the translator as well, was born in Stendal in 1776, and had connections in that city. He had been an editor of a journal in Stendal devoted to forensic medicine (*Magazin fuer die gerichtliche Arzneikunde,* 1781-85)[11] which had been printed by Franzen and Grosse, the same printers whose names appear on the title page of Ellisen's *Feld-Pharmakologie.* After practicing medicine in several German cities, Uden had come to Russia in 1786 where he achieved success in medical service to the Emperor and became Professor of Pathology and Therapeutics at the Medico-Chirurgical Academy in St. Petersburg.

Johann Georg David von Ellisen (d. 1830) was born in Hanover, Germany. After practicing medicine in his native country, he entered the governmental medical service of Russia where he subsequently became a member of the Imperial Medical College in St. Petersburg. In 1808 Uden and Ellisen collaborated in the publication of a civilian hospital formulary (*Pharm. sive index medicamentorum atque formularum medicarum in usum institutorum piorum . . .* Petropoli, 1808).[12]

In a two-page unsigned preface to the work which Callisen states was written by Uden, the editor mentioned his reasons for the usefulness of the *Feld-Pharmacologie.* He pointed out that a formulary with a suitable commentary was more meaningful to the inexperienced, younger physician in the field who might be unfamiliar with many of the drugs perfunctorily listed in catalogue form. Uden also mentioned that the *Feld-Pharmacologie* would be very welcome to numerous German physicians serving in the army and stationed in the provinces.

Of great interest is the 20-page introduction by Ellisen (pp. iii-xxii) which follows Uden's prefatory statement. The author began by informing the reader that a new critical spirit was afoot in the world ("ein Geist der Pruefung und Kritik") affecting all scientific activity. This spirit of the age required that inductive reasoning, observation, trial, and critical acumen be applied to the use of medicines. A lofty scientific motive was not all that was involved in writing the formulary. The Imperial Medical College, the author was careful to note, felt a deep sense of

duty towards that honorable class of people ("ehrwuerdige Menschenklasse") who gave the best years of their lives to the defense and honor of their fatherland. It was a pleasure, therefore, for the College to authorize and approve the formulary as an aid to the sick and wounded, but invincible Russian warrior.

The most significant portions of Ellisen's preface dealt with policies and rationale of drug selection. No soldier, stated the author, should be deprived of the best in medication. Field hospitals and pharmacies are mobile, and only the most essential medications should be transported for long distances. To have any remedies that were unproven would only embarrass the physician.

Economy was another important consideration in the selection of medication for the formulary. No drugs should be brought from foreign countries, argued the author, which could be secured cheaper and in a fresher condition at home. The vastness of Russia, the diversity of soil and climate, and Russian ingenuity were sufficient to yield many indigenous remedies. A number of these should find acceptance in a military formulary. The author questioned the superiority of foreign medicinals such as guaiac or sarsaparilla over certain indigenous plant drugs.

The necessity of not cluttering up the field pharmacies with superfluous drugs was stressed repeatedly by Ellisen. Instead of using oil of almonds which was prone to become rancid in making emulsions, the author recommends indigenous oil of hempseed. "Our northern, fresh linseed oil should be used for plasters and ointments," announced the writer, "instead of the French and Italian oils which are mostly spoiled, and even when fresh are not superior." Balsam of Copaiba was no better than home-produced turpentine, and as for foreign ethereal oils, they were almost always adulterated and had no place in a field pharmacy. Tamarinds and cassia were fine for Egyptians and East Indians; the Russian soldier did well with a cooked concoction of potassium bitartrate and honey and didn't need foreign drastic cathartics, except for jalap. As for sweet essences and other remedies popular with the public, it stood to reason that these were unacceptable in a military formulary. Of the preparations of iron, only iron filings were to be used for sick soldiers, who were not to be pampered with tinctures of iron made with apple and quince juices. No costly resins were to be employed in plasters. Finally, in a burst of Russian nationalism, which sounds ludicrous today coming from the mouth of a German, the writer proclaimed: "One will look in vain to find fragrant and cosmetic substances here; neither of these is needed by our clean and brave fighter," ("Wohlriechende und Schminkmittel sucht man vergebens; beide gebraucht unser reinliche und brave Streiter nicht").

Ruſsiſch Kaiſerliche

FELD-

PHARMAKOLOGIE.

Auf Befehl und mit Genehmigung des Reichs-Medicinischen Collegiums.

1802.

Fig. 1. Title page of J.G.D. von Ellisen's "Feld-Pharmakologie." Courtesy of the National Library of Medicine, Washington, D. C.

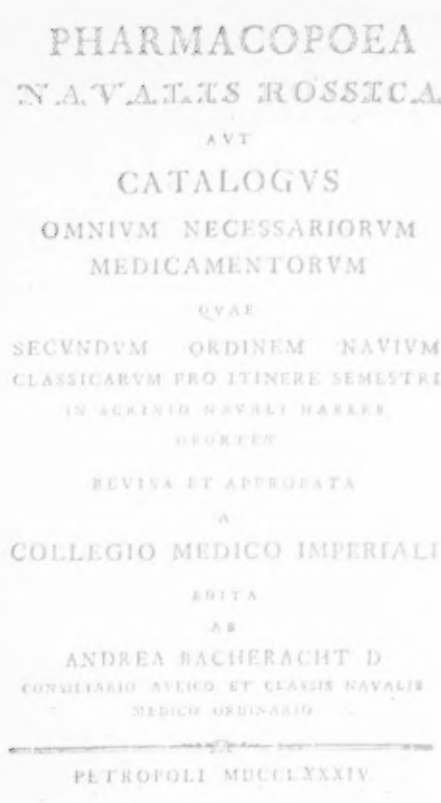
PHARMACOPOEA
NAVALIS ROSSICA
AVT
CATALOGVS
OMNIVM NECESSARIORVM
MEDICAMENTORVM
QVAE
SECVNDVM ORDINEM NAVIVM
CLASSICARVM PRO ITINERE SEMESTRI
IN ACERNIO NAVALI HABERE
DEORTET
REVISA ET APPROBATA
A
COLLEGIO MEDICO IMPERIALI
EDITA
AB
ANDREA BACHERACHT D
CONSILIARIO AVLICO ET CLASSIS NAVALIS
MEDICO ORDINARIO
PETROPOLI MDCCLXXXIV.

Fig. 2. Title page of Bacheracht's "Pharmacopoea Navalis Rossica." Courtesy of the University of Wisconsin Library

A final important factor was underscored by the writer as influencing the selection of drugs for the formulary. Certain medications, wrote Ellisen, spoil in transport, especially when the army is on the move over great distances. It was therefore impractical to stock such preparations in a field pharmacy as "Spirit of Mindererus, volatile liniments, ointments, various plasters, and the like." In answer to those critics who might consider the formulary too restricted, Ellisen retorted that a good physician could do well with a few remedies, while another would be able to accomplish little with many.

Ellisen's introduction was followed by 181 pages of monographic material alphabetically arranged. These monographs discussed in detail the alphabetical listing of medicinals given in the tables of supply on pages 182-185 which contained about 113 separate items. The remaining pages 186-191 comprised the index to the book. By and large, the monographs gave information concerning habitat of plant drugs, method of preparation if a chemical, therapeutic actions and uses, mode of administration, dosage forms, formulations, and occasional cautions. As for the tables of supply, they listed the amounts of medication to be stocked by regimental and battalion pharmacies for one year. Quantities of drugs were set up according to number of military personnel, *i.e.*, for 500, 1000, 2000, and 4000 men.

A reviewer in the *Allgemeine Literatur-Zeitung* aptly summed up the caliber of Ellisen's *Feld-Pharmacologie* in the following words: [it] "contains within the limits of restricted brevity many good medical and pharmaceutical observations, which, although not really new, will probably be read for the first time by those physicians and surgeons for whom this work was chiefly intended."[13]

Bacheracht's Pharmacopoea Navalis Rossica

Credit for the compilation of the first naval formulary in Russia belongs to Heinrich Bacheracht (1724/5-1806) who was born in St. Petersburg where he received his preliminary medical training. In 1746 he was sent to study at Leiden and obtained his medical degree there four years later. Upon his return to St. Petersburg, he served as a physician in the artillery and Corps of Engineers, and subsequently attained a high-ranking medical post with the fleet. One of his most noteworthy contributions was a treatise on scurvy for the use of army and navy surgeons published in 1786, and printed in Russian and French.[14]

Bacheracht's *Pharmacopoea navalis* was dedicated to Count Chernichev, Vice-President of the Imperial College of the Admiralty. In his dedicatory preface written in French, the author clearly stated his objectives in writing the formulary which are worth quoting in full:

> To His Excellence, Count Ivan de Chernichev, Vice-President of the Imperial College of the Admiralty, Chief of Port and Galleys,' Presently Chamberlain to His Sacred Imperial Majesty, Knight of the Orders of St. Andrew, St. Alexander Nevsky, St. Waldimer, the White Eagle, and of St. Ann:
> Sir:
>
> The diligent work of Your Excellence, in behalf of the navy and the tireless attention to all that might contribute to its advantage and progress, are conducive to making those who have the honor to be attached to this department show their mettle, so that animated by the same zeal, I have nothing so much at heart than to be more and more useful to my country in the position which I occupy.
>
> This motive led me to publish in 1780, an essay in the Russian language on the means of conserving the health of seamen, particularly of those in Russia. The Imperial College of the Admiralty, in deigning to receive this work with the most indulgent kindness, has encouraged me to redouble my efforts. I have felt the necessity to supply—in its complete absence in our navy—a systematic catalogue which shows the nature and quantity of drugs and utensils necessary for each ship in proportion to its class. Having also observed that the chests in which they are to be placed, being very unhandy for surgeons who are forced to rummage around in them and who even sometimes empty entirely the whole chest

> whenever they have need of a drug, I have prevented this inconvenience by inventing new chests proportionate to the size of different ships in which the drugs will not only be preserved from the vicissitudes of the sea, but also arranged in such a way that in opening them one will have all of the drugs exposed to view so that the surgeons will no longer be obliged to rummage about and to disarrange everything in order to find what they need.
>
> The Imperial Medical College, after having examined and approved these two objects ordered, as a consequence, all naval pharmacists to fill the new chests according to my catalogue, which made me decide to have it printed, so that a copy of it be placed in each chest for the direction of surgeons who will also find in the catalogue some formulas for medicines prescribed by the most celebrated practitioners. This work is closed with instructions on how to establish a sick bay on ships, in which I furnish directions for the arrangement of the sick, and I indicate the provisions needed for their food, their beds, and their clothes. The catalogue is in Russian and Latin; the quantity of drugs is designed for a six-month voyage; the instructions and necessary provisions are written in Russian for the benefit of our national surgeons.
>
> Such is the book which I take the liberty of dedicating to Your Excellence. I trust that you will excuse its imperfections in favor of the reason which made me undertake this, and that you will deign to receive it as a public homage of respectful devotion with which I have the honor to be your very humble and obedient servant,
>
> André Bacheracht
> *Physician to the Fleet*
>
> St. Petersburg, 1783

It is unfortunate that Bacheracht had not included illustrations or diagrams of the drug chests he had designed in his formulary. The table of supply (pp. 9-22), which follows the author's dedicatory preface, listed about 150 drug items intended for a six-months voyage. As can be seen from *fig. 3,* the quantity of drugs allotted varied with the class of ship, which ranged from a fast frigate of 32 guns to a battleship of 100 guns, with two intermediate classes of 66 and 74 guns respectively.

A similar table of supply listing surgical and pharmaceutical equipment under the title "Utensilia" (pp. 23-26) mentions such items as glassware and earthenware jars of various sizes, cork, sponges, tin tubes for clysters, an iron spatula for spreading plasters, writing paper and string. Each vessel in any four of the classes was entitled to one small brass mortar and pestle and another mortar and pestle made of stone.

Pages 27 to 43 consisted of a collection of 42 prescriptions ("Variae medicamentorum compositiones"). These were notable for their simplicty and freedom from the "shotgun" dimensions one usually associates with prescriptions in the more pretentious pharmaceutical compendia of the day. This uncluttered list of drugs and prescriptions was noted in a contemporary review which remarked on the simple and uncomplicated nature of the formulary.[15] Directions on how to maintain a sick bay and how to treat the sick ("De nosocomio navali et cura aegrorum") were given on pages 44 to 50. A discussion of diet for sick personnel on the ship ("De cibo et potu aegrorum in nosocomio navali") was presented on pages 51 to 58, and included a table of supply listing food needed for thirty days in the sick bay ("Index victualum pro nosocomio navali pro triginti diebus").

The formulary ended with two pages of concluding remarks. Among other things, it was pointed out that the ship's surgeon should check the contents of the medicine chest against the list given in the formulary. Any medication which was missing had to be reported to the surgeon's superior officer, and if necessary, permission could be granted to buy the missing medication in the foreign region or port where the ship was stationed. It was the surgeon's duty to see that medicines were not carelessly dispensed and that the glass and small containers were not damaged. Furthermore, the surgeon was not to entrust the chest keys to anyone else, and to note in a book all the medicines dispensed.

On land, the naval apothecaries filled the chests designed by Bacheracht, while on board ship, the naval surgeons dispensed and compounded medications, using the ingredients of the medicine chests as well as Bacheracht's formulary. This formulary was official in every sense of the word; it had been authorized and approved by the Imperial Medical College and it had been published in the Russian pharmacopeia of 1784. That the *Pharmacopoea navalis Rossica* was of more than local interest may be inferred from the fact that the formulary was also published in 1784 by Didot le jeune in Paris, and by Koenig in Strassburg.[16]

Sir James Wylie's Pharmacopoeia Castrensis Ruthena

It would be difficult to exaggerate the importance of Wylie's contributions to military and administrative aspects of Russian medicine during the first half of the nineteenth century. One evaluation of Wylie which appeared in *Lancet* (1897), characterized him as "the most prominent figure in the medical world in Russia" during his time.[17] A graduate of Aberdeen, where he had received his medical degree, James Wylie served first in Russia as a senior surgeon in the crack Eletsky regiment, and then as body surgeon to Emperor Paul in 1798. He became Inspector General of the Army Medical Board of Health in 1808, then the first director (1811-1836) of the newly created medical department of the War Ministry, distinguishing himself in the war against Napoleon. Be-

cause of Wylie's outstanding services, Alexander I, who succeeded Paul, prevailed upon the Prince Regent of England to knight Wylie, and subsequently obtained for him an English baronetcy.

Wylie also served as first president from 1804 to 1835 of the newly-founded Medico-Chirurgical Academy which replaced the old Imperial Medical College. During the latter half of the nineteenth century the Medico-Chirurgical Academy, which had undergone another change of name and had become the Military Medical Academy (1835), has been described by Garrison as the center where "most of the greater medical men of Russia were educated."[18] A clinical hospital bearing Wylie's name, and a statue of him were erected in St. Petersburg after his death. Besides publishing a military formulary, Wylie also made contributions to the literature of yellow fever (1805), scabies (1811), plague (1829), cholera (1831), conjunctivitis (1835), and was responsible for extensive improvements in the Russian hospital system.[19]

The first edition of Wylie's *Pharmacopoeia Castrensis Ruthena* which appeared in 1808 was indeed impressive both in size and execution. In size, the book measured 13 cm. by 21 cm.; it contained 434 pages of monographic text and 66 pages of prefatory and supplemental material. In execution, it displayed an erudition bordering on the pretentious. The Scottish physician had come a long way from his Aberdeen days, for his name on the title page had all the awesome authority of the Russian Empire behind it: *Jacob Wylie augusto omnium Russiarum imperatori a consiliis status actualibus, S.M. Archi-Chiriatro, Medicinae et Chirurgiae Doctore, summo rerum medicarum in universo exercitu Inspectore . . .* , and his dedication to the ruthless and powerful Count Arakcheyev (1769-1834, Minister of War under Paul I and Alexander I: *Excellentissimo ac illustrissimo domino Alexio Andreadi comiti de Araktschejew, senatori intimi imperialis constilii membro, rei militaris administro, collegii militaris membro primario, peditatus summo inspectori . . . . . .*

In his preface, Wylie admitted that he had been influenced by the Edinburgh, London, and Prussian Pharmacopoeias in compiling his formulary (preface, p. xii). The preface was followed by miscellaneous information on weights and measures and a table of dosage according to the age of the patient.

Pages 1-176 comprised the first part of the work, and was called "Pharmacologia." This first portion consisted of 154 items of materia medica, arranged in a comprehensive monographic series, many of them based on material in the London, Edinburgh, Dublin, Prussian and Russian pharmacopeias. Each monograph contained the Latin title of the drug followed by the synonym in Latin and the common name in Russian. The author then proceeded to give a de-

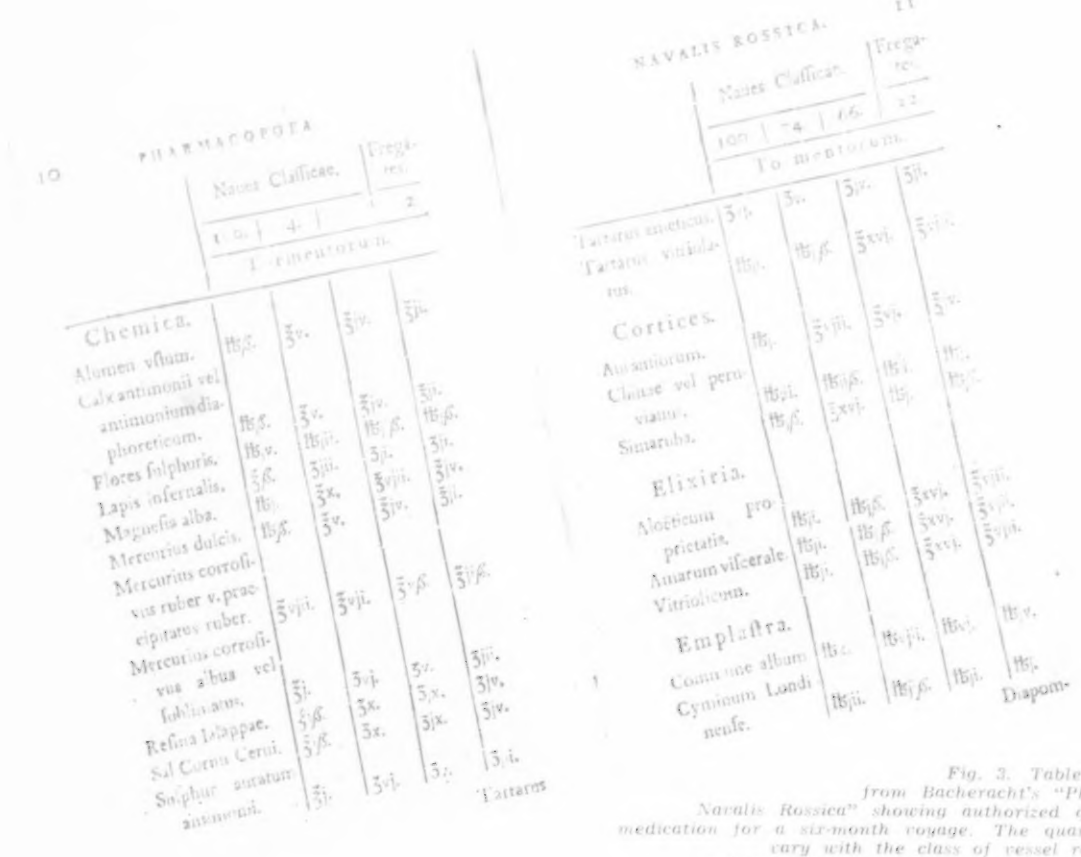

Fig. 3. Tables of supply from Bacheracht's "Pharmacopoea Navalis Rossica" showing authorized quantities of medication for a six-month voyage. The quantities listed vary with the class of vessel ranging from a frigate of 32 guns to a battleship of 100 guns. Courtesy of the University of Wisconsin Library

tailed discussion in Latin of the physical description, properties, therapeutic indications of drugs, as well as citation of authorities, preparations, dosage, and antidotes when indicated. Linnean classification and contemporary botanic nomenclature were given; habitat and part of the plant drug used were stated; and finally, there was the acceptance of the new chemical nomenclature.

The second part of the work entitled "Praeparata et Composita" (pp. 177-388) consisted of over 300 monographs similar to those of the first part, but dealing with compounded remedies. This was followed by an index (pp. 389-422) listing the new and the old names of medicines contained in the formulary and tables of supply (pp. 423-434). The most extensive of these tables listed 132 items of "a selected list of medicines which are to be procured each year from the pharmaceutical laboratories of the Emperor, each medicine to be acquired in a quantity designed to serve 2000 troops assuming 10% are stricken." One table, entitled "Utensilia" listed pharmaceutical and miscellaneous supplies in a similar fashion to the table given in Bacheracht's naval formulary, enumerating such items as mortars and pestles, glassware, bottles, jars, shears, spatulas, tin clyster tubes, etc. Wylie's book concluded with a 38-page supplement in Russian.

As would be expected, a work of this kind, written by so eminent a person as Wylie, was bound to attract considerable attention outside of Russia. Among those journals which reviewed the first edition of Wylie's formulary were the two most distinguished pharmaceutical publications on the continent—Trommsdorf's *Journal der Pharmacie*, issued in Leipzig,[20] and the renowned *Bulletin de Pharmacie* of Paris.[21]

The reviewer in Trommsdorf's journal was very enthusiastic: "This classic work," he wrote, "which has been introduced as a standard into the Russian army, will certainly meet with the entire approval of German physicians and surgeons. It is not a spiritless compilation, but a carefully thought out work, in which the author demonstrates his versatile and deep knowledge." The reviewer also complimented Wylie for being familiar with the new developments in chemistry.

However, a different kind of review was presented by Dr. J. J. Virey in the *Bulletin de Pharmacie* in 1814. Virey, an editor of the *Bulletin*, and former Chief Pharmacist at the military hospital of Val-de-Grâce was, like all Frenchmen, still smarting under the devastating military defeat which the French had suffered at the hands of the Russians. This was obvious from the very first wry sentence of the review: "Since it has been our lot to meet up with the Russians ("Puisque il nous a fallu voir des Russes") it will not be without interest to glance over their military

Fig. 4. Portrait of Sir James Wylie (1768-1854). Courtesy of the National Library of Medicine, Washington, D. C.

medicine and their formulary of prescriptions." Virey hinted that James Wylie might not be the real author after all, and that the work might have been composed by anonymous scholars ("mais des personnes qui pensent s'y bien connaître doutent que cet ouvrage soit dû à celui qui s'en proclame l'auteur. Ces incrédules vont jusqu' à se persuader que l'archi-chirurgien a employé le travail de personnes savantes dont il n'a fait nulle mention.") After planting this seed of doubt in his reader' minds, Virey hastened to add in a footnote that "We do not pretend to judge this fact . . . above all it is necessary to be fair." There then followed a few bitter remarks on how persons in high positions were always regarded as the most capable and how the humble pharmacist or physician didn't stand a chance.

Most of the review was taken up with quotations and comments on formulae and preparations which were little or not at all known in France. At one point Virey remarked exultantly that "one sees with pleasure that the new nomenclature of the French has triumphed as far as the icy reaches of the North and the banks of the Neva." ("l'on voit avec plaisir la nouvelle nomenclature chimique des Français triompher jusques sous les glaces du Nord et sur les bords de la Néva"). As a parting shot, Dr. Virey pointed out that the author of the *Pharmacopoeia Castrensis Ruthena* borrowed extensively from foreign pharmacopeias. ("on observera qu'elles sont presque toutes empruntées de pharmacopées étrangères, surtout de celles de Prusse et d'Angleterre.")

Succeeding editions of Wylie's formulary were published in 1812, 1818, and 1840. With each new edition the work became more voluminous. Thus, in 1812 it numbered 433 pages; in 1818 it had 618 pages; and by 1840 it had mushroomed into a large Latin tome of 820 pages. It is interesting to note that a copy of the third edition (1818) of Wylie's formulary now in the possession of the National Library of Medicine in Washington has the following handwritten letter attached to the inside cover of the book addressed to the Surgeon General U.S.A:

Sitka, Alaska
July 4, '74

Surgeon General U.S.A.
Washington

General

I have forwarded this day by mail to the S.G.O. a book which I found in this hospital and which I thought might be worth placing in the library of the S.G.O.

It is the Ph. Castrensis Ruthenica in latin and published in St. Petersburg. I presume it was left by the Russians at the time the territory was transferred.

Very Respectfully,
Your Obed. Servt.
Jno. Brooke
Asst. Surg. U.S.A.

The fourth edition (1840) of Wylie's work was reviewed in the *British and Foreign Medical Review* (1842). Among the observations that are particularly worth noting are the following: "This work may be considered both as a treatise on pharmacology and a pharmacopoeia, and in many respects it is similar to our British dispensatories . . . A great number of inert vegetable preparations have been admitted, and there are no fewer than fourty-four formulae for extracts . . . it has few defects when compared with its merits . . . It is thoroughout characterized by accuracy of research, generally by sound therapeutic views, and by the acquaintance with the modern discoveries in medical science. The Latinity is on the whole good; the work is beautifully got up, and extends upwards 800 pages . . ."[22]

The statement that Wylie's work had the characteristics of a treatise on pharmacology, a pharmacopeia and a British dispensatory was quite true. It was certainly too ponderous for field use as a practical military formulary. The tables of supply present in the first edition were missing in the third and fourth editions. A copy of the 1840 edition which is in the National Library of Medicine was inscribed by Wylie in St. Petersburg in 1843, and presented to Dr. Robley Dunglison (1798-1869), Professor at the Jefferson Medical College in Philadelphia.

Thus, from 1765 to the time of Wylie, the early Russian military formulary had developed from a simple catalogue of drugs to a large Latin tome, valuable no doubt as a reference work but too unwieldy in the smaller field hospitals. These military formularies vied for prominence with the Russian national pharmacopeias which were inadequately enforced during a period when foreign influence was all-pervasive.

Acknowledgement: This paper was assisted by a research grant from the American Society of Hospital Pharmacists and Lederle Laboratories.

I am indebted to Professor Pack of the Department of Classical Studies, University of Michigan, and to Mr. Ronald A. Hagler, Library Service Fellow, University of Michigan, for their assistance in untangling several knotty problems in translating from the Latin.

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4. *The British and Foreign Medico-Chirurgical Review*, 30(1862), 300.

5. C. Méhu, "Sur la Pharmacie Russe," *Journal de Pharmacie et de Chimie*, 22, fourth series (1875) 60.

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8. I am indebted to the following two sources for much of my bibliographical information: A.N. von Scherer, *Codex Medicamentarius Europaeus* (Leipzig, 1822) Sectio Septima, and Adolph C.P. Callisen, *Medicinisches Schriftsteller-Lexicon der jezt lebenden Aerzte, Wundaerzte, Geburtshelfer, Apotheker und Naturforscher aller gebildeten Völker* (Copenhagen, 1830-1845), 33 volumes.

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PATIENT ORIENTED HOSPITAL STANDARDS

a realistic approach to state regulation

by OLIVER J. NEIBEL, JR. *in collaboration with* PHILIP A. AUSTIN *and* AL J. BAILEY

► THE HEALTH OF OUR PEOPLE HAS LONG BEEN recognized as both an economic asset and a social blessing. It was a subject of ancient literature and philosophy, and never, perhaps, has civilized man been oblivious to its importance. Recently, the highest court of one of our states unequivocally stated it thus: "Among all the objectives sought to be secured by government, none is more important than the preservation of the public health; and, an imperative obligation rests upon the state through its proper instrumentalities or agencies to take all necessary steps to accomplish this objective."[1]

Perhaps there is no institution more intimately connected with the health of our citizenry than the hospital, whose whole purpose and reason for existence is the alleviation of human ills and suffering. It, therefore, should not be considered unusual or disturbing for society, or, if you will, the state, to prescribe minimum standards and rules and regulations for such institutions. It is essential that such standards provide for the safe handling of drugs by all professional disciplines within the institution, for drugs and medicines ever increasingly constitute the "lifeline" of the modern hospital.

Professional people should not have to be reminded that their professions exist for service to individuals and mankind. The converse cannot be condoned.

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Likewise, it is unfortunate that frequently we have to remind ourselves that our hospitals and clinics exist for our patients, not *vice versa*. It is with this philosophy in mind that the State of Washington has approached the regulation of hospitals and hospital pharmacy operations.

A Pharmacy Defined

A pharmacy in Washington, not unlike other states, is subject to registration and regulation by the State Board of Pharmacy regardless of whether it is located in a hospital or in some other environment. Our statutes define a "pharmacy" as including "every place in which physicians' prescriptions are compounded or dispensed and where drugs and medicines are compounded and dispensed."[2] Washington law makes it "unlawful for any person to compound or dispense drugs, medicines or poisons, or to operate any place of business for wholesaling or retailing, compounding or dispensing drugs, medicines or poisons, unless he is a registered pharmacist, or places a registered pharmacist in charge thereof."[3] Our statutes require the owner of every pharmacy or dispensary to register with the Board of Pharmacy and pay a nominal annual license fee.[4] The Board of Pharmacy is required by law to "exercise general supervision over, and direct the enforcement of, the provisions of law relating to pharmacy."[5]

Thus, standards for the operation of pharmacies, including hospital pharmacies, are traditionally the province of the State Board of Pharmacy. This is where the fundamental responsibility rests today and is as it should be.

Pharmacy Service an Integral Unit

In 1955, the Washington State Legislature enacted a hospital licensing law for the primary purpose of promoting "safe and adequate care of individuals in hospitals through the development, establishment and enforcement of minimum hospital standards for maintenance and operation."[6] The State Board of Health was given the responsibility for the establishment, after consultation with an advisory council, of standards, rules and regulations for the construction, maintenance and operation of hospitals and the State Department of Health was charged with the enforcement of the adopted standards, rules and regulations.[7]

It at once became apparent that pharmacy services were an integral part of "maintenance and operation" of a hospital. Furthermore, it was coincidentally recognized that in the hospital environment there were many professional disciplines involved in the purchasing, handling, storage, dispensing and administration of drugs. This total drug picture in the operation of hospitals was of serious concern to the Department of Health in the development of regulations. It is conceivable that it would have been entirely possible for the Department of Health to have ignored the interests and prerogatives of the Board of Pharmacy and to have independently developed regulations governing the handling of drugs in hospitals. Likewise, the Board of Pharmacy could have continued to develop and enforce hospital pharmacy standards without regard for the concerns of the Department of Health in over-all hospital operation. Fortunately, neither was the case.

The Department of Health and the Board of Pharmacy recognized at the outset that a cooperative approach was necessary, an approach with an aim towards best possible patient care consistent with a recognition of the prerogatives of the various disciplines practicing in our hospitals. A committee was then formed consisting of representatives of the state medical society, hospital association, nurses' associations, pharmacists' association, hospital pharmacists' association, Board of Pharmacy, Department of Health, and the Attorney General's Office. This committee was charged with the responsibility of recommending to the State Board of Health and Board of Pharmacy standards for the operation of hospital pharmacies and the handling of drugs within the hospital.

Basic Goal

At this point, I think that it would be well to take cognizance of some fundamental facts which are all too often overlooked by the sometimes overzealous members of the various health professions. All professional people working in hospitals are interested in the same basic goal—better patient care. The achievement of this goal cannot be achieved by any one professional group working in a vacuum. Too often, under the guise of protection of the professional prerogatives of a given discipline, the fundamental goals of healing and ministering to the sick are neglected for reasons of purely economic or professional protection.

The Washington committee began its work agreeing on the basic premise that all professions working in a hospital are interested in the safe and efficient handling of drugs and medicinal preparations, to the end that the hospital's patients will receive the best possible care. All recognized the serious professional and legal responsibilities and the life and death potential involved in the handling of drugs. The physician is concerned, for through his activities in the development of the hospital formulary and the prescribing of drugs for patient use he assumes responsibility for almost 100 percent of the medications used in the hospital. The nurse is vitally interested in the handling of drugs, for over 90 percent of all medications

used in a hospital are administered by her. The hospital administrator is interested, for it is his duty to coordinate and implement all hospital policies, functions, and disciplines and frequently to pay the bill. The Department of Health must be concerned, for it has the over-all legal responsibility for prescribing safe and adequate conduct of hospital operations. And, of course, the Board of Pharmacy and the pharmacist, especially the hospital pharmacist, are vitally and fundamentally concerned, both legally and professionally, with the selection, purchasing, compounding, storage, and dispensing of all drugs and medications. It was through the joint effort of all these professions with these attitudes that the committee evolved standards for hospital pharmacies in the State of Washington.

Access to Pharmacy

In the development of our pharmacy standards, the one area which gave us most concern was resolving the question of who was to have access to the pharmacy or central drug supply during the times that the pharmacist was not on duty and present in the hospital. The problem of providing pharmacy coverage after normal pharmacy hours has been the subject of no small interest among the hospital professions.[8]

Our first area of agreement was that both legally and as a matter of patient welfare, no one but a registered pharmacist should be allowed to compound drugs or have access to the central narcotic or barbiturate supply. At the same time, it was agreed that accessability to all other drugs was essential to adequate patient care. Full recognition was given to the existing practice of securing necessary drugs in emergent situations by a variety of hospital personnel in the pharmacist's absence. When a medical decision is made that a patient is in immediate need of a drug that is not available in floor supply, that drug is usually secured and administered promptly and generally without concern for safe pharmacy practices of accountability. Any system to be adopted must provide proper safeguards for emergency use.

Emergency Cabinet Rejected

The second step was the rejection of the night emergency cabinet or locker. Most of us had seen this system in action and felt that there was grave danger that the emergency locker would grow into a pharmacy in and of itself with almost no control over access and little opportunity to fix responsibility for drug usage. Where possible an "on-call" program for the hospital staff pharmacist is ideal, but the size of many of Washington's hospitals and the communities in which they are located made this impractical.

It was finally determined to provide that, other than the pharmacist, only one registered professional nurse per shift was to have access to the pharmacy for limited purposes. Actually, the only keys to the pharmacy would be in the possession of the pharmacist and the designated RN who would deliver them to her relief on going off shift. This decision was not easily arrived at and constituted much give-and-take on the part of the various professions involved.

Drug Dispensing vs. Drug Administration

Of great assistance in resolving this question were the distinctions which have been so ably made by Dr. George F. Archambault[9] between drug dispensing (a pharmaceutical act) and drug administration (a nursing act.) This distinction bears repeating by quotation:

> (1) *drug dispensing* involves the issuance of one or more doses of a medication in containers other than the original, such new containers being properly labeled by the dispenser as to contents and/or directions for use as indicated by the prescriber or (2) drug dispensing is the issuance of a medication in its original container with a pharmacy prepared label that carries to the patient the *signa* of the prescriber as well as other vital information or the package carries a label prepared for nursing station use in a hospital. The contents of the container may be for one patient (such as an individual prescription) or for several patients (such as a nursing station medication container).
>
> In *drug administration,* a nursing act, a single dose is administered to a patient by the nurse as a result of an order of a physician or dentist. . . . The removal from the pharmacy to the nursing station of a single dose of a drug from the original container by a nurse for a specific patient falls under *drug administration* and is legal. However, the filling or refilling of a nursing station medication container or a properly labeled, prepackaged, nursing station medication container or a similar prepackaged, and properly labeled medication from a pharmacy emergency or night service unit with the drug called for is *dispensing* and can be engaged in legally only by a licensed pharmacist. . . . . Also, it can be argued that the removal of the original container from the storeroom or pharmacy to a nursing station is *drug administration* and is a legal nursing act. . . . Note that *no* transfer from container to container occurs nor is there a possibility of label error.[10]

This makes sense. This is legally sound. Dr. Archambault's distinction fixes professional responsibility, with a recognition of the interprofessional roles involved in handling hospital medications.

Ready Availability of Medications

Recognizing that no one other than a registered pharmacist may compound or dispense drugs and that drug administration is a nursing act, Washington was able to adopt a regulation designed to afford the ready availability of any medications which might be

needed in patient treatment. This regulation I should like to set forth in full:

Access to Pharmacy

Ouly a pharmacist may have access to the pharmacy stock of barbiturates and narcotics.

Only a pharmacist may have access to the pharmacy stock of drugs except that in a pharmacist's absence from a hospital a registered nurse, designated by the hospital, may obtain from a hospital pharmacy stock of drugs such drugs as are needed in an emergency, not available in floor supplies (excepting narcotics and barbiturates), and the nurse, not the pharmacist, becomes accountable for her actions. Only one registered professional nurse in any given eight-hour shift may have access to the pharmacy stock of drugs. A registered nurse is not permitted to compound or dispense drugs.

A nurse may remove from the pharmacy stock of drugs:

a. A drug in its original container or a drug prepackaged by a hospital pharmacist for nursing service use in the hospital.
b. A single dose of a drug from the original container for a specific patient.

A nurse shall leave in the pharmacy on a suitable form a record of any drugs removed, showing:

a. The name of the drug
b. The name of the manufacturer
c. The dosage size
d. The amount taken
e. The date
f. The time
g. The signature of the nurse.

Further, she shall leave with the record the container from which the single dose was taken for drug administration purposes in order that it may be properly checked by a pharmacist. Such records shall be kept for three (3) years.

It is to be emphasized that as nearly as possible, the entire regulations as set forth in the appendix provide for 100 percent accountability for medications from the time of delivery to the hospital to the time of their ultimate use or disposition and prevent the haphazard securing of drugs by unauthorized personnel.

The state of Washington really has done nothing astonishingly new. It has only recognized the necessity of interdisciplinary cooperation on matters which vitally affect patient care and welfare. We have tried to remember, as I stated earlier, that our hospitals exist for our patients. We have attempted to orient our approach and our regulations to this fundamental principle. In particular, we have developed standards and regulations governing hospital pharmacy operations which we believe to be technically correct, legally sound, reasonable, understandable, and enforceable. These standards have been jointly adopted by the Washington Board of Health and the Washington Board of Pharmacy and are now in effect in our state. This is the first time identical standards have been adopted by a state hospital licensing agency and the board of pharmacy.

References

1. *State of Kansas v. Fadley*, 308 Pac. 2d 537 (1957)
2. Revised Code of Washington §18.64.010
3. Revised Code of Washington §18.64.020
4. Revised Code of Washington §18.67.020
5. Revised Code of Washington §43.69.030
6. Revised Code of Washington §70.71.010
7. *Ibid*
8. Hassan, W. E., Jr.: Six Ways to Provide Pharmacy Coverage after Normal Pharmacy Hours, *Hospitals, Journal of the American Hospital Association 32*:54 (May 16) 1958, and You Can Provide 24-hour Pharmacy Service, *Hosp. Management* 85:50 (Sept.) 1958.
9. George F. Archambault, Ph.C., D.Sc., LL.B., is a Member of the Massachusetts Bar, Pharmacist Director, Chief, Pharmacy Branch, Division of Hospitals, Department of Health, Education, and Welfare, U.S. Public Health Service, Washington, D.C.
10. Archambault, G. F.: The Law of Hospital Pharmacy, *Amer. J. Hosp. Pharm. 15*:593 (July) 1958.

Washington State Department of Health Hospital Pharmacy Standards

► The following Hospital Pharmacy Standards (Section 10-3) were adopted by the State Board of Health October 2, 1959 and replace Section 10-3 "Pharmacy" as adopted January 3, 1958 and which appears on page 19 of the printed Hospital Licensing Law and Standards, Rules and Regulations. These same standards were adopted by the Washington State Board of Pharmacy August 10, 1959 under their appropriate authority as the standards of the Board governing hospital pharmacy practices.

10-3 Pharmacy

10-3.01 The hospital shall provide for the proper handling and storage of drugs.

10-3.02 Definitions

10-3.02.01 *Pharmacy* refers to the central area in a hospital where drugs are stored and are issued to hospital departments or where prescriptions are filled.

10-3.02.02 *Pharmacist* refers to one currently registered as a pharmacist in the State of Washington under the provisions of Chapter 18.64 RCW.

10-3.02.03 *Prescription* means an order for drugs for a specific patient given by a duly licensed physician, dentist or other person legally authorized to write prescriptions transmitted to a pharmacist for dispensing to the specific patient.

10-3.02.04 *Legend Drugs* are those drugs bearing the manufacturer's legend, "Federal law prohibits dispensing without a prescription."

10-3.03 Functions of Pharmacy

10-3.03.01 The functions of the hospital pharmacy shall include:

a. Distributing routine drug supplies to hospital departments and issuing drugs on prescriptions or special orders for individual patients.
b. Bulk compounding of sterile and nonsterile pharmaceuticals as determined by hospital policy and regulations.
c. Dispensing and/or compounding drugs for home use for patients as necessary in compliance with Federal, State and local laws.
d. Purchasing, accounting for, storing, labeling, issuing and controlling drugs.
e. Maintaining records on narcotics, tax free alcohol and other pharmaceuticals as are required by Federal, State and local laws.
f. Complying with Federal and State laws controlling drugs and pharmacy operation.

10-3.04 Organization, Administration and Staffing

10-3.04.01 The hospital pharmacy shall be under supervision of a pharmacist.

10-3.04.02 Drugs located in other areas of the hospital shall also be under the supervision of the pharmacist who shall keep adequate records in accordance with 10-3.08.09, 10-3.08.10 and 10-3.09.

10-3.04.03 The responsibility and authority of the pharmacist shall be clearly defined in writing by hospital authorities.

10-3.04.04 Adequate, properly trained personnel shall be available to fulfill the functions of the pharmacy.

10-3.04.05 Hospital pharmacy services shall be available often enough to provide drugs, supplies and prescriptions without undue delay.

10-3.04.06 It is recommended that there should be a Pharmacy and Therapeutic Committee composed of representatives of the medical staff, hospital administration, the nursing department and the pharmacist. The pharmacist should serve as secretary to the committee. This committee should meet at least semi-annually.

The committee should:

a. Develop and maintain an up-to-date formulary of accepted drugs for use in the hospital.
b. Serve as an advisory group to the hospital pharmacist on matters pertaining to choice of drugs to be stocked.
c. Evaluate clinical data concerning drugs requested for use in the hospital.
d. Add to and delete from the list of drugs accepted for use in the hospital.
e. Prevent unnecessary duplication in the stock of the same basic drug and its preparation.
f. Make recommendations concerning drugs to be stocked on the nursing units and other services.

10-3.04.07 Every hospital shall have its pharmacy policies, rules and regulations and procedures in writing. These should be developed by the Pharmacy and Therapeutic Committee.

10-3.05 Pharmacy Facilities

10-3.05.01 An adequate area which is properly lighted and ventilated and suitably equipped to carry out all pharmacy operations, including proper storage of all pharmaceuticals, shall be provided.

10-3.05.02 A library including the current U. S. Pharmacopeia, National Formulary, New and Nonofficial Drugs, and U. S. Dispensatory, and such other references as are needed for effective pharmacy operation is required.

10-3.05.03 Special locked storage for narcotics and barbiturates and special additional storage for flammables shall be provided.

10-3.05.04 The pharmacy shall be arranged in an orderly fashion and be kept clean, and all mechanical equipment shall be in good repair.

10-3.06 Purchasing, Storage, Labeling and Control of Drugs

10-3.06.01 The pharmacist should furnish specifications for the purchase of all pharmacy drugs, chemicals and pharmaceutical preparations even though a purchasing agent may do the actual procurement through a centralized department.

10-3.06.02 Physicians' advice should be sought through the Pharmacy and Therapeutic Committee in setting up any standards for specifications of drugs.

10-3.06.03 Purchase, storage and control of drugs shall be such as to prevent having outdated, deteriorated, impure or improperly standardized drugs in the hospital.

10-3.06.04 Purchase of narcotics shall be in compliance with State and Federal laws and regulations.

10-3.06.05 Purchase, storage and control of tax free alcohol shall be in accordance with applicable State and Federal laws and regulations.

10-3.06.06 All flammable materials shall be stored and handled in accord with applicable local and State fire regulations.

10-3.06.07 All drug containers in the pharmacy or in other areas of the hospital shall be clearly and legibly labeled to show drug's name (generic and trade) and strength.

10-3.06.08 Poisonous external and caustic drugs shall show proper warning or poison labels and shall be stored separately from other drugs.

10-3.06.09 The pharmacist shall be completely responsible for all labeling of drugs.

10-3.06.10 All medicines, poisons and stimulants kept in any hospital department shall be plainly labeled and stored in a specially designated, well illuminated cabinet, closet or store room, and made accessible only to authorized personnel.

10-3.06.11 The pharmacist shall regularly and periodically visit all departments of the hospital and check all drugs and pharmaceuticals as to the proper name, strength, storage condition, expiration date and warning label, and should remove at once any unlabeled or incorrectly labeled drug item. It shall be the responsibility of the pharmacist to confer with department heads regarding abnormal or erratic use of drugs and to make necessary adjustments in the approved maximum quantities of drugs issued to departments with proper approval. (See 10-3.08.01)

10-3.07 Bulk Compounding of Pharmaceuticals

10-3.07.01 A pharmacist shall be in charge of bulk compounding of pharmaceuticals. This does not prohibit the registered nurse from making weaker aqueous solutions from concentrated solutions or pre-weighed units (such as tablets) which are properly labeled by the pharmacist or manufacturer with specific directions for dilution. Neither does it prohibit the registered nurse from adding prepared sterile additives to parenteral solutions as specifically directed by the physician.

10-3.07.02 All hospital pharmacies in which any compounding is done shall have proper instruments of measure available in accord with the State Board of Pharmacy regulations.

10-3.07.03 All drugs used in compounding shall be handled to avoid contamination through contact with measuring devices, transporting devices or weighing devices.

10-3.07.04 Sterilization of pharmaceuticals shall conform to the standards set by the U. S. Pharmacopeia.

10-3.07.05 All drugs compounded or manufactured in the hospital shall be carefully labeled as to strength, content and, if need be, expiration date.

10-3.08 Distribution or Issuance of Drugs

10-3.08.01 The hospital shall have lists of drugs (including narcotics, barbiturates and emergency drugs) indicating the approved maxi-

mum amounts of each drug generally to be issued to hospital departments. These lists should be developed by the Pharmacy and Therapeutics Committee.

10-3.08.02 Drugs may be given to patients in the hospital only on the order of a physician, dentist or other person legally authorized to write prescriptions. No change in order for drugs shall be made except with the approval of the physician, dentist or other person legally authorized to write prescriptions.

10-3.08.03 Antidotes should be available for emergency cases involving poisoning. The stock of antidotes to be maintained should be determined by the Pharmacy and Therapeutic Committee.

10-3.08.04 A prescription is required for all legend drugs and narcotics issued to employees or to a patient for use outside the hospital.

10-3.08.05 Only a pharmacist may compound and/or dispense drugs.

10-3.08.06 Records of prescriptions filled by the pharmacist shall be properly filed and kept for five (5) years.

10-3.08.07 The pharmacy shall keep proper records of issue of all legend drugs.

10-3.09 Handling of Narcotics, Barbiturates and Tax Free Alcohol

10-3.09.01 Careful records shall be kept of receipt of narcotics and a perpetual inventory of narcotics shall be maintained.

10-3.09.02 Adequate records of all narcotics issued shall be maintained in the pharmacy and shall contain for each issue of narcotics:

a. The date.
b. The name of the drug.
c. The amount of the drug issued.
d. The name of the person who issued the drug.
e. Name of the department to which the drug was issued.
f. The name of the person who received the drug.

10-3.09.03 Adequate records of narcotic usage shall be maintained and shall contain for each drug used:

a. The date.
b. The time of administration.
c. The dosage of the drug which was used.
d. The name of the person to whom the drug was administered.
e. The name of the physician who ordered the drug.
f. The signature of the person who administered the drug.

These records shall be submitted to the pharmacist for safe keeping.

10-3.09.04 Periodic check of narcotic usage records should be made by the nursing supervisor and/or the pharmacist to determine whether the drugs recorded on usage records have also been recorded on patients' charts.

10-3.09.05 Use of multiple dose vials of narcotics is not recommended as they make accounting for narcotics difficult and make substitution and dilution of narcotics possible.

10-3.09.06 All narcotics in any hospital department except the pharmacy shall be checked by actual count by two persons at the change of each shift. Adequate day-to-day accountability records shall be maintained and shall contain the time each check of a narcotic supply was made and the signature of the person who made each check.

10-3.09.07 All narcotic records shall be kept for three (3) years.

10-3.09.08 Adequate accountability records for barbiturates shall be maintained and include records of purchase, receipt, usage and inventory of barbiturates. Such records shall be kept for three (3) years in compliance with Federal Food and Drug Law on legend drugs.

10-3.10 Access to Pharmacy

10-3.10.01 Only a pharmacist may have access to the pharmacy stock of barbiturates and narcotics.

10-3.10.02 Only a pharmacist may have access to the pharmacy stock of drugs except that in a pharmacist's absence from a hospital a registered nurse, designated by the hospital, may obtain from a hospital pharmacy stock of drugs such drugs as are needed in an emergency, not available in floor supplies (excepting narcotics and barbiturates), and the nurse, not the pharmacist, becomes accountable for her actions. Only one registered, professional nurse in any given eight hour shift may have access to the pharmacy stock of drugs. A registered nurse is not permitted to compound or dispense drugs.

A nurse may remove from the pharmacy stock of drugs:

a. A drug in its original container or a drug pre-packaged by a hospital pharmacist for nursing service use in the hospital.
b. A single dose of a drug from the original container for a specific patient.

A nurse shall leave in the pharmacy on a suitable form a record of any drugs removed showing:

a. The name of the drug.
b. The name of the manufacturer.
c. The dosage size.
d. The amount taken.
e. The date.
f. The time.
g. The signature of the nurse.

Further, she shall leave with the record the container from which the single dose was taken for drug administration purposes in order that it may be properly checked by a pharmacist. Such records shall be kept for three (3) years.

10-3.11 Responsibilities of Pharmacist

10-3.11.01 The pharmacist shall be responsible for:

a. Preparing and sterilizing of injectable medication when manufactured in the hospital.
b. Issuing drugs, chemicals and pharmaceuticals.
c. Filling and labeling drug containers issued to other hospital departments.
d. Inspecting all drugs and pharmaceuticals in all hospital departments.
e. Maintaining the approved stock of drugs.
f. Issuing all narcotic drugs and alcohol and maintaining a perpetual inventory of them.
g. Maintaining records which are required legally.
h. Supervising the maintenance of the facilities of the pharmacy.
i. Maintaining current information on State and Federal laws pertaining to drugs and drug handling and keeping the hospital administration properly informed.

10-3.11.02 It is recommended the pharmacist also be responsible for:

a. Specifying quality and sources for purchasing of all drugs, chemicals, antibiotics and pharmaceuticals for use in treatment of patients.
b. Furnishing information concerning medications to physicians, residents and nurses.
c. Participating in formulating pharmacy policies and carrying them out in accordance with the established policies of the hospital.
d. Cooperating in teaching courses in the School of Nursing and in other educational programs.
e. Implementing the decision of the Pharmacy and Therapeutics Committee.
f. Preparing periodic pharmacy reports for submission to the administrator of the hospital.
g. Maintaining, in cooperation with the accounting department, a satisfactory system of records and bookkeeping in accordance with the policies of the hospital for: (1) charging patients for drugs and pharmaceutical supplies, and (2) maintaining adequate control over the requisitioning and dispensing of all drugs and pharmaceuticals.

TOXICOLOGY FOR THE HOSPITAL PHARMACIST

by ARTHUR J. MCBAY

► BECAUSE OF THEIR TRAINING AND POSITION ON THE medical team, pharmacists are often consulted concerning poisons and their effects. They are not only asked about the constituents of various products but also if these can be detected in biological media. This paper will include information concerning simple and adequate toxicological analyses that the pharmacist is capable of performing.

In cases of poisoning where emergency toxicology is necessary to establish the causative agent, there is rarely sufficient time for more than a few determinations. The history and symptoms will provide clues. Even when the poison is known, symptomatic treatment is most commonly employed. Those familiar with various toxicological techniques are, in some instances, well aware of the futility of a general search for poisons even when both time and adequate material are available. One or two determinations at the most is all that can be attempted with the amount of sample and time available in an emergency. Extensive toxicological searches should be reserved for the experienced toxicologist.

About 8,000 poison deaths are reported in the United States every year. It is estimated that about one million are poisoned during a year. About half of the poison fatalities are due to carbon monoxide and about one sixth are due to barbiturates.

Most Common Poisons

More than 75 percent of the determinations made in a toxicology laboratory are for alcohol, barbiturates, and carbon monoxide. Some of the frequent determinations are for arsenic, lead, cyanides, phosphorus, fluorides, mercury, salicylates, morphine, strychnine, paraldehyde, and chloral hydrate. These would account for about 95 percent of the determinations conducted in most laboratories. Two excellent books outline the methods commonly used in toxicological analysis.[1,2]

It must be remembered that in most toxicology laboratories samples obtained at autopsy are hemolyzed and because of this their problems may differ from those encountered in emergency cases. For example, it is unlikely that cyanide or nicotine would be encountered in emergency toxicology because when sufficiently toxic amounts are taken, death is usually too rapid to allow treatment.

Methods for the analyses of some commonly occurring substances are given. Practice on known samples and the use of controls are very important.

It must be emphasized that it is impossible by any known methods to completely eliminate the presence of more than a few poisons. All too often poisoning is suspected and toxicology is requested in the belief that the elimination of the presence of poisons is easy. Any search for poisons must have direction. The history and symptoms indicate certain substances and rule out others. A general toxicological search is out of the question because of the time and samples available in emergency cases. The analyses for substances not mentioned here should be reserved for the experienced toxicologist.

Although it is helpful to obtain containers and labels of the suspected poison, they can be misleading even when it has been established that the contents have been ingested. The analysis of such preparations is usually too time-consuming to be of much aid in an emergency.

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Ethyl Alcohol

The determination of ethyl alcohol in blood is the most common toxicological analysis. Many times alcohol determinations are used as an aid in the diagnosis of coma. It must be apparent that a high concentration of alcohol may not be the only cause for coma. Since other volatile substances interfere, care must be observed in interpreting any findings. If it is desirable to screen conscious patients a test such as the Alcotest is inexpensive, fast, and very easy to perform. In this test, a measured volume of air is breathed through a tube which changes color according to the amount of alcohol in the breath. If the actual level of alcohol in the blood must be calculated from the breath, then an instrument such as the Breathalyzer can be used. The amount of alcohol in blood or urine and the presence of interfering substances (paraldehyde, acetaldehyde, acetone, formaldehyde, isopropyl alcohol, and methyl alcohol) may be determined by methods given in one of an excellent series of articles on alcohol published in the *Journal of the American Medical Association*.[3]

Microdiffusion procedures which employ Conway cells are useful for determining ethyl alcohol and other volatile substances such as methyl alcohol, acetone, acetaldehyde, formaldehyde, cyanide, carbon monoxide, and halogenated hydrocarbons.[4]

Barbiturates

Anyone attempting to do toxicology is certain to be asked to determine barbiturates. Before analyzing an unknown sample, the analyst must make trial runs on known samples to check reagents and technique. An ultraviolet spectrophotometer is required for any reliable barbiturate procedure. Extract 5 ml. of blood with 20 ml. of chloroform A. R. in a 50 ml. glass-stoppered centrifuge tube (Corning No. 8424). Centrifuge and then withdraw 16 ml. of the bottom layer by means of a hypodermic syringe. Extract this with 5 ml. of 0.05 N sodium hydroxide. Centrifuge and withdraw 4 ml. of the aqueous phase. Extract the aqueous phase with 10 ml. of chloroform and discard the chloroform. Make the *p*H of the aqueous phase about 10.5 by adding 1 ml. of 0.2 M boric acid, filter through wetted paper. Determine the spectrum from 220 to 300 millimicrons. Make the solution acid with 2 or 3 drops of 10 percent sulfuric acid solution and redetermine the spectrum. The first spectrum should peak at 240 *mu* and the second should drop gradually as the wavelength increases (Fig.1).

Calculation: Let "A" equal the absorbance at 240 *mu* of the *p*H 10.5 solution minus the absorbance at 240 *mu* of the acid solution.

$$\text{mg.\% barbiturate} = \frac{A \times 25 \times 5 \times 5 \times 20 \times 100}{1000 \times 4 \times 16 \times 5} = 3.9A \text{ or } 4\ A$$

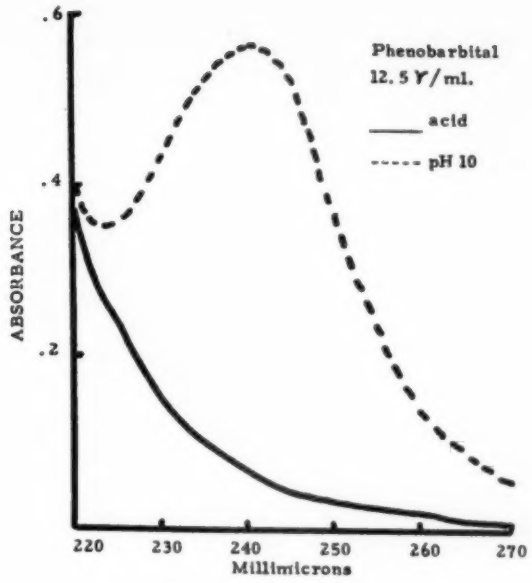


Figure 1. Barbiturate absorbance can be determined using an ultraviolet spectrophotometer and calculating the concentration of the drug

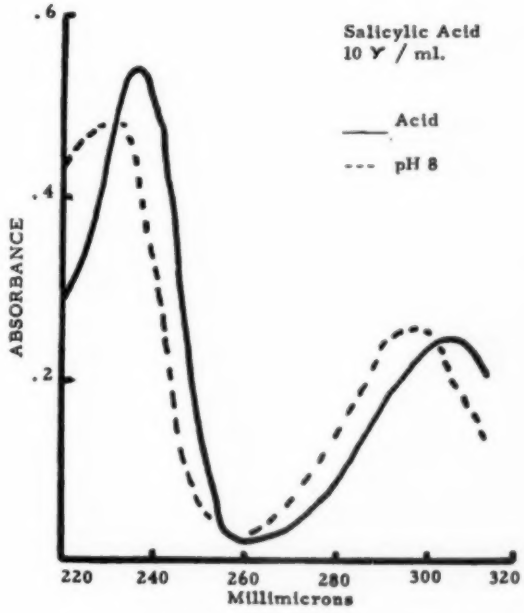


Figure 2. Aspirin and methyl salicylate may be detected in the body as salicylate and the concentration of absorption determined

The blood level of a barbiturate unfortunately does not mean too much unless it is known which barbiturate is present in the blood. A level of 1 mg. percent may be attained by taking 15 mg. of phenobarbital three times a day for mild sedation. The same level of secobarbital could be considered adequate cause for for death. Levels of 1 to 2 mg. percent of secobarbital, pentobarbital and amobarbital and of about 8 mg. percent of phenobarbital should be considered dangerous. To identify the barbiturate, a paper chromatographic method[5] may be used. The presence of more than one barbiturate is often encountered.

Salicylates

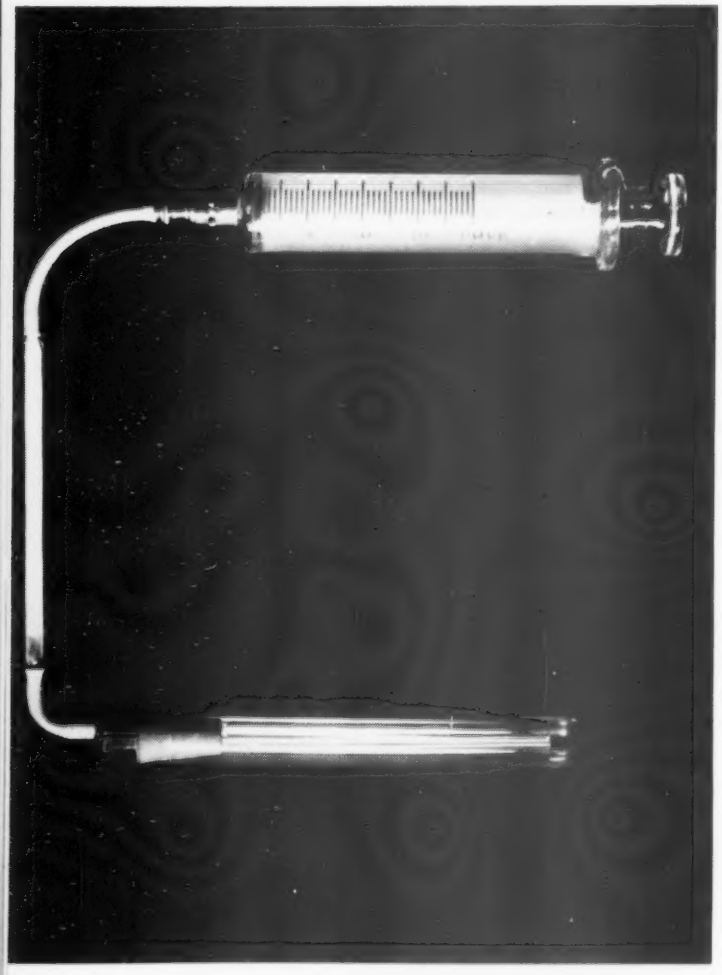
Aspirin and methyl salicylate may be detected in the body as salicylate. To one ml. of serum add 1 ml. of 10 percent sulfuric acid and 20 ml. of chloroform A.R. Shake the mixture for one minute, filter the chloroform phase through a dry filter paper. Extract 15 ml. of the chloroform phase with 5 ml. of 0.05 N sodium hydroxide solution. Separate and add 1 ml. of 0.2 M boric acid solution to 4 ml. of the aqueous phase. Filter, determine the spectrum (Fig.2) from 220 to 320 *mu*, add 2 or 3 drops of 10 percent sulfuric acid, and redetermine the spectrum. If the absorbance is too great, dilute the solution.

Calculate the concentration from the absorbance of the basic solution at 295 *mu* mg.% salicylates:

$$\frac{\text{Absorbance} \times \text{ml. final dilution} \times 5 \times 20 \times 100 \times 40}{4 \times 15 \times 1 \times 1000}$$

$6.7\ \text{Abs}_{295} \times \text{ml. final dilution} = \text{mg.\% salicylates.}$

Figure 3. Apparatus for determining carboxyhemoglobin



Carbon Monoxide

Although there are many tests for carboxyhemoglobin, probably the easiest and most reliable is one employing palladium tubes.[6] In addition to the tubes, a test tube with two glass tubes and a hypodermic syringe completes the apparatus (Fig.3).

Reagent

Potassium ferricyanide	4.0
Saponin	1.0
Water, to make	125.0
(Antifoam, if available)	1 drop

Add 0.1 ml. of blood to 5 ml. of the ferricyanide reagent. Immediately connect the palladium indicator tube. After two minutes aspirate about 100 ml. of gas. If the color of the chemical in the tube changes to a deep green or blue, the blood is over 50 percent saturated with carbon monoxide. If there is no significant change, add about 1 ml. of blood and repeat. Now if there is no significant change, the level is less than 10 percent. Estimations of the amounts may be made by setting up standards as directed in the original article.[6] Levels up to 10 percent may be found in smokers or some industrial workers. Mine Safety Appliances supplies a kit for the determination of carbon monoxide by sampling either alveolar air or blood.

Heavy Metals

Arsenic, mercury and bismuth (Reinsch Test)

Prepare a copper coil by winding some copper wire around a pencil. The coil should be about half an inch in length with about 2 inches of wire for a handle. Clean the coil by dipping it briefly into concentrated nitric acid followed by washing with distilled water. Place the coil and 20 ml. of urine in a 50 ml. Erlenmeyer flask. Add 4 ml. of concentrated hydrochloric acid and heat the flask on a water bath for 45 minutes. Keep the volume constant by adding distilled water. Darkening of the portion of the coil beneath the surface indicates one of the above metals. When such darkening occurs it is advisable to perform further tests.[7] The U.S.P. arsenic test may be performed directly on the coil. The presence of any of the above metals is not normal.

Although an excellent method is available for the determination of lead,[8] this analysis should be made by a chemist familiar with the method.

Organic Bases

The ultraviolet spectra of organic bases may be used for the identification and quantitation after appropriate extraction from biological material.[9] Special methods must be used for morphine and heroin.[10] Caution must be observed in interpreting spectra, since nicotine and nicotine-like materials are found in smokers and vitamins and other harmless bases may be present. Many of the organic amines such as ephedrine, desoxyephedrine, amphetamine, Benadryl, Darvon and Ritalin, have similar spectra. The phenothiazine tranquilizers have similar spectra and chemical properties.

It has been reported that large amounts of amphetamine[11] and also Preludin have been ingested with subsequent recovery.[12] Most of the so-called "safe" non-barbiturate sedatives which can be sold without a prescription contain the organic base methapyrilene.

Phenothiazine Tranquilizers

A very simple and rapid test for phenothiazine derivatives follows: One ml. of urine is mixed with one ml. of a solution containing 4 parts of 10 percent sulfuric acid and 1 part of 5 percent ferric chloride solution. A pink or purple color indicates the presence of phenothiazine derivatives. The test is sensitive to therapeutic amounts of the drug. The color may be matched to a color chart for quantitation.[13] The lack of color indicates the absence of significant amounts of the drugs.

Meprobamate

To 3 ml. of urine in a glass-stoppered centrifuge tube are added 0.2 ml. of 1 N sodium hydroxide and 5 ml. of ether. Shake 5 minutes and centrifuge the tube. Two ml. of the ether phase are evaporated to dryness under a stream of air in a heavy-walled test tube, and 1 ml. of concentrated sulfuric acid is added. The tube is heated at 100°C. for 30 minutes. After the solution is cooled, 2 ml. of water are cautiously added to intensify the color. The mixture is allowed to stand for 15 minutes and the absorbances are measured at 450 and 500 *mu*.[14]

The toxicology of Doriden, Thorazine, and Meprobamate has been reviewed recently.[15]

Miscellaneous

When paraldehyde poisoning is suspected, acidosis should be anticipated because paraldehyde deteriorates to acetic acid.[16] An occasional alcoholic may be suffering from a combination of Antabuse and alcohol.[17]

A recently published method will allow the quantitation of trichlorethanol, trichloracetic acid (the metabolites of chloral hydrate), and chloral hydrate.[18]

Summary

Methods have been presented for the determination of the substances most frequently encountered in toxicology. Although pharmacy training provides an adequate background for toxicology, the analyses should never be attempted in critical cases without first practising on known samples. The intepretation of any results must be reserved for those experienced in toxicology.

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PHARMACISTS, PRESCRIPTIONS, & PUBLIC RELATIONS

by SISTER M. ROSINA

► PHARMACISTS, PRESCRIPTIONS, AND PUBLIC RELATIONS is an unlimited subject. However, for the purpose of this discussion let us look upon the hospital as the whole body and upon the departments as the members or organs of that body. When something happens to an organ of an individual, all the other organs are affected in one way or another. So, in the hospital, if something befalls one department, the other departments are affected directly or indirectly, depending upon the nature of the happening. If it is a minor friction, probably the only effect upon others would be short, snappy answers and a feeling that tension is present. On the other hand, however, if it is a major friction, all departments may suffer greatly as a result of this experience. In one way or another, practically everything that happens in the hospital involves the people who comprise the staff.

Problems beset us in our daily living. At every turn, we face petty annoyances, major irritations and frustrations. There is no avoiding this conflict. Deal with it

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we must or pay the penalty in mental pain and inability to do our work properly. Let us pause a moment and consider a few important facts that are pertinent to the problems of the hospital pharmacist before we discuss the specific prescriptions we are going to use in the treating, relieving, and curing the maladies that afflict us.

The first important fact to consider is that in the last few decades the tremendous progress made, both in medicine and hospital development, has resulted in a radical change from a relatively simple hospital to the highly developed and necessarily complicated institution of today. This change, beneficial as it has been, inevitably has led to certain problems, largely those of human relationships.

Public relations, as the term signifies, has to do with relationships between human beings, between persons. Because of this fact, these relationships will always remain qualitatively different from our relationships with thing. A person can never be treated as an instrument or a things. A person always possesses a dignity and a value of, and in, himself. In spite of this value and dignity, however, public relations will always be a struggle because we are working with people and for people. This calls for everlasting adjustment and readjustment to different temperaments and personalities without number, and often results in friction, which, of course, is undesirable. However, if we had no frictions or problems that would be paradise, or heaven, but both are not for here—paradise was lost with the fall of our first parents and as a result, we must work to win heaven. So, with conditions as they are and with each of us a weak human being, we must first seek help from God. Then, we must do all we can to prevent frictions. When they arise, as we know they will, we need some special medication or treatment to cure these conditions. Some major prescriptions that may be used in treating friction will be discussed in this paper.

Secondly, let us remember that in order to prescribe intelligently for any illness, we must know what is causing it or at least have a fairly good idea of its cause. Therefore, in prescribing for the malignant disease of "public hypertension," we must first decide on the cause or causes of it. As there are over 100 different things that can produce a headache, so too, it will not be too much of an exaggeration to say that there are just as many causes for poor public relations. To cure this disease, we must realize that the treatment will call for effort on our part. Good public relations don't just happen. There is no magic formula for preventing or curing poor public relations. It will require many prayers, a great deal of work and a tremendous amount of patience to bring about the desired relationships. Therefore, it is well to bear in mind when discussing public relation programs that there are no "systems" or "gadgets" or "techniques" which, when applied, will automatically work.

The science of human relations has not developed to the stage where such knowledge is available, and it never will, because people are not the same. Human nature is not made in the same mold. We are all different intellectually, emotionally and physically.

The next thing we need to consider after a diagnosis is made, besides the prescription for its cure, is the mixer and dispenser of these prescriptions.

As in the hospital we need the physician to prescribe, the pharmacist to mix and the nurse to administer the medication, so in public relations we need individuals to prescribe, compound and administer the prescription. The group of specialists who are to do this are in a selected class. These experts are you, whether you be the chief pharmacist, staff pharmacist, technician, representative, or what have you. You are the experts who are going to compound the powders, elixirs, etc., to make the prescription of good public relations.

It is important for us to realize that administrative practices are inherent in every position of the hospital pharmacy. The pharmacist of today is no longer a technical person, he is now an executive. In addition to his professional qualifications, today's hospital pharmacist is experienced to be a good organizer, handy at leading and managing people, expert in accounting, purchasing, storekeeping, marketing and budgeting and a research man with an inquisitive turn of mind.

As a department head, your three-fold concern of personnel administration should be the improvement of relations between the employee and his work, between the employee and his fellow workers and between the employee and you, the employer. Any director or department head can do a good job of getting along with the employees if he will take the trouble to understand them and work out a program which will be of benefit both to the hospital and to them. In other words, the successful director or supervisor, is the one who, in addition to knowing technics, also understands human nature and knows how to apply this knowledge effectively. It is not how much you know that counts, but how well you put your knowledge to use.

Finally, we must consider the approach to the problem of public hypertension, or poor public relations. This approach should be a positive one if it is to be successful. We must act, we must do things and above all we must keep a positive attitude. By this I mean you should reflect cheerfulness, optimism, understanding and initiative. It is fun to play the game of the correct attitude. You can change the attitude of a whole group by looking for the best

in others and by having a tolerant attitude. So look at the whole picture and adjust your thinking into the positive.

And now to discuss the specific prescriptions that will cure or alleviate poor public relations. As mentioned before, there has been tremendous advancement in medicine and hospital work in the last few years. One of the recent important advances in medicine has been the knowledge of vitamins. Everyone is talking about vitamins and taking vitamins. As our knowledge of these substances grows, their importance becomes greater and greater. We have found that vitamins are necessary for the normal processes of body metabolism and that their lack or absence results in a deficiency disease or hypovitaminosis.

As vitamins are essential nutrients and must be supplied to keep the human body functioning properly, so too, the vitamins of public relation must be supplied to keep the hospital body working smoothly. A lack of public relation vitamins will result in deficiency diseases such as reduced production, personnel friction, and lowered morale. We know a great deal about the vitamins we use in medicine, but what about the public relation vitamins? Let us examine them and their effects upon public and relationships.

Vitamin A in the human body is related to growth, nutrition, sight and resistance to infection.

Vitamin A of public relations is *Patience*. It prevents friction, promotes the growth of personnel morale and stimulates productiveness.

Vitamin B in medicine, as originally described, has been found to be a combination of many factors rather than one vitamin. This group of factors is called vitamin B complex, and is necessary for normal human nutrition and well being. Its absence results in loss of appetite, loss of vigor, etc.

Vitamin B complex of public relations is *Christ-like Charity*. The presence of this vitamin in the hospital body keeps the tempo of relationships normal and functioning properly. It stimulates friendly relations, promotes the Brotherhood of Man, raises morals and makes for happy employees, something which money cannot buy.

Vitamin C in the body is directly concerned with the oxidation-reduction reaction of all living cells. It is also concerned with the formation of collagen, the supporting structure of the bones, teeth, blood vessels and red blood cells.

Vitamin C of public relations is *Justice*. This vitamin is a virtue that inclines us to give every man what belongs to him. It is an essential element in all the activities of the hospital. It brings about truthfulness, proper respect for others, helpfulness, gratitude and the formation of good relationships, the supporting structure of the hospital body. In medicine, vitamin C is very frequently given in combination with other vitamins after a surgical procedure to promote healing and thus hasten recovery. So too, in public relations this vitamin administered along with the other vitamins of public relations promotes the healing of injuries, major or minor, and hastens the recovery to normal.

Vitamin D in the body is essential for bone growth and tooth development. It is an absolute necessity if we are to develop strong, healthy bones and become strong healthy individuals.

In public relations, this vitamin D is *Understanding*. This is so important in public relationships that without it relationships are strained, undesirable, and unhappy. Good public associations cannot exist without understanding.

Vitamin E in medicine is thought to be of value in sterility although there is no scientific basis for this in human beings.

Vitamin E in public relations is *Cheerfulness*. It creates a pleasant atmosphere, inspires trustfulness and stimulates confidence. It dispels depression, unhappiness and the lethargy due to lowered morale. It is the vitamin that brings about an optimistic view of our problems.

In life, *Vitamin K* is used to prevent and stop hemorrhage.

The vitamin K of public relation is *Prudence*. This vitamin helps us in judging correctly on all occasions the right way of acting. It enables us to interpret rightly, directions, rules and advice as well as actions. It prevents the loss of good relations due to negligence, inconsiderateness, indifference, instability, and precipitation.

Vitamin P in the human body has to do with the permeability of the capillaries. Deficiencies of it result in hypoproteinemia.

Vitamin P in public relations is *Thoughtfulness*. It prevents weakness in public relationships and counteracts frictions, lowered morale and all afflictions caused through thoughtlessness.

Use the vitamins of public relations generously each day and I can assure you that your public hypertension will be greatly reduced. We need not worry about an overdosage because in using public relations vitamins that is impossible. Another thing too, people are not allergic to these vitamins.

Of course, you know that vitamin pills are not a substitute for all the essentials of life. Important as vitamins are, they are only a part of the whole picture of nutrition in the human body. So too, in the hospital body, the vitamins of human relations are only a part of all the factors essential for a healthy relationship of all personnel and all departments.

Human relationship between the departments, be-

tween the workers, whether advantageous or otherwise, depends upon the people who work in the institution. We are unable to escape interdepartmental relationships in the modern hospital of today because one department cannot give complete and adequate care.

That this relationship be good cannot be overemphasized. There must be teamwork if the hospital is to function smoothly and efficiently. When people work well together, they do a better job. When the personnel in the various departments understand each others' functions, everyone benefits. And as someone so aptly put it, "they all become proud together."

To secure this desired relationship of all personnel and all departments, we have several prescriptions we can use. Probably the prescription of the most value is that of good personnel policies, because it prevents untold frictions, saves many hours of time, insures justice and helps to reduce the high cost of personnel turnover.

Each institution and each department has personnel policies. Although a hospital may not have written policies, they exist, nevertheless, because they are implied in the orders, decisions or opinions of the administration. Unwritten policies, however, are dangerous to both management and employee because frequently they are misinterpreted.

Written policies must be developed so that they can serve as guides to action in the personnel problems. Each department should have clearly defined duties with no overlapping on several departments. The duties for each employee within each department should also be clearly defined and outlined so as to prevent overlapping within the department. Such clearly defined duties will prevent frictions due to "passing the buck" and will enable the one in charge to have at his finger tips the employee responsible for each duty. All policies and all duties or procedures must be made understandable at every level, since they set the tone of the hospital and affect the morale of the employee.

Personnel policies, to be effective, must consider the employees' desires within the framework of the hospital's objectives. Employees of any category are human beings and worthy of consideration. Concern for their well being pays dividends.

Policies that are based on fairness, on the rights of individuals as children of our Heavenly Father, and on the respect for the intelligence, the preparation and the personalities of those employed are desired and are acceptable.

Cooperation between the administrator, department heads and workers is extremely important for smooth operation. Misunderstanding and friction can and often does develop when there is not a clear definition of the responsibility of each and the relationship of each other. There should be a clear understanding of the organizational structure and the lines of authority. Too many bosses are bad for all concerned and lead to unnecessary frictions, hard feelings and wasted time to say the least. Supervisors or department heads must have authority proportionate with their responsibility if they are to carry out their duties properly. A written statement of policy might solve many embarrassing situations. The people within any institution appreciate knowing what the policies are and it is convenient for them to have a written policy to which they can refer. These policies should be kept in places accessible to all. They should be reviewed periodically to make certain they meet current needs. Written policies are possible in all hospitals, and all departments. They are a *must* for good public relations.

Clearly stated aims, well defined and understood policies, the privilege of being a part of the hospital organization and not merely an appendage of it; these are necessary for wholesome relationships.

In the medical arts, the primary purpose is to prevent disease or to restore the diseased body to as nearly normal functioning as possible. It is the primary purpose of the art of public relations in the hospital body to prevent discord or to restore disturbed morale and activities to normal. In treating abnormal functions, we use certain groups of drugs frequently. Two of these groups are the stimulants and depressants. Of course, the stimulants increase the functions of an organ or the body and the depressants decrease these functions.

In good public relations, we want to stimulate good relationships and to restore harmony if it has been disrupted. We want to depress tension and friction when it does happen. We want to prevent it whenever possible.

Briefly, let us consider the things in public relations which will stimulate and secure good public attitudes and relationships. The caffeine of public relations, so to speak, is *Consideration for others.* Everyone likes to be given merited consideration and everyone responds to it. There is a tendency in human nature to magnify defects and to overlook good qualities. Too many people forget to praise those who deserve commendation.

We must be generous with praise, not empty words but heartfelt plaudits. If we remember that "Hardening of the Heart makes one grow old faster than hardening of the Arteries," perhaps it will be easier to be more considerate of others. No pay envelope, no promotion, no fine equipment and no external factor can mean as much to a worker or to any person as being sincerely appreciated. When sincerely expressed, it is no wonder that the oft-repeated Bibical

quotation, "well done, thou good and faithful servant," strikes such a responsive note in every heart receiving it. Employee satisfaction cannot be obtained until the employee has a sense of security, a sense of belonging and a sense of recognition because these three things are the basic needs of us all. The administrator and supervisor in particular, must deal out smiles and kinds words to all hands at all times.

Employees should like their company as well as their job. Since people are different, it is part of your job to know your personnel and treat them accordingly. Their needs must be respected and the dignity and importance of each job must be stressed.

Adequate and proper physical facilities stimulate good personnel attitudes and activities and prevent unfavorable ones. It is a proven fact that the condition under which an employee works in any type of organization influences the quality and quantity of his output, the satisfaction he derives from his work, his loyalty to the employing agency, and the values he gains from the experience. The administrator should obtain what is needed in regard to the physical plant. However, the department heads should beware of wanting the most expensive and everything on the market. Friction is inevitable if such desires are not controlled.

Careful screening of applicants is one of the basic prescriptions for preventing personnel friction and poor public relations. We should not hire persons who are not right for the job. You simply cannot fill the space of a round hole with a square peg. Good organization also requires that sufficient thought be given to placement of the worker in the department. The assignment should be sufficiently stimulating to make the employee a satisfied worker.

An adequate orientation program for the new employee is essential to establish rapport. It gives him insight into the institution, establishes the feeling of belonging and prevents others from slighting him.

To secure enthusiastic day-in and day-out response from the public workers, find out what people want —their basic human needs—then conduct all your activities in such a way that those needs will be satisfied.

Two especially valuable prescriptions to use in this endeavor are common sense and courtesy. You cannot buy, but you have to earn enthusiasm, initiative, loyalty and devotion of hearts, minds and souls. The hospital pharmacist who wants to know how to earn devotion will probably find all the help he needs in the Sermon on the Mount.

The hospital pharmacist or any administrator can get no more effective performance than he is able to deliver personally. The way he does his own work is an inspiration to everyone else. A good boss ranks among the top reasons for a worker's being satisfied with his job. Subordinates tend to glorify the boss and make him a symbol of the organization. You must live up to this symbol at all times, because your example will be followed by your personnel.

Be democratic and friendly to all; employees, representatives, nurses, etc., and beware of favoritisms. Never consider any of the duties of your department beneath your dignity as a department head. This is often one of the chief causes of friction. Make the most of your sense of humor. It will carry you through many a rough spot. A keen sense of humor is an important asset in any type of human relations. If you must criticize an employee or another department, do it in private, with tact, and be sure the criticism is constructive.

Have an open mind to suggestion, complaints and criticisms. Remember that others, as a rule, are better judges of your services than you are. Make it possible to talk things over in confidence with individuals, department heads or others and to iron out the difficulties that may arise.

Avoid the mechanical, impersonal, uncooperative and "too busy" attitudes. They cause unnumbered frictions.

Since the lack of charity causes a multitude of frictions, perfect charity will prevent a multitude of frictions. We must forget self and think of others. We should think frequently of St. John's admonition: "Little children, love one another." Self-pity and selfishness are as deadly as arsenic to peace of heart. Besides, self-pity is often accompanied by criticism of others in an effort to excuse or alibi self and usually result in public hypertension. Flying off the handle does not help, either; it just upsets people and makes conditions worse.

Remember, we will get better service by being kind and courteous rather than by being rude and disagreeable. In meeting the problem of poor public relations, something more than reason and knowledge is needed; if we are to act wisely, we must also listen to the counsel of the heart.

Bearing all the foregoing in mind, in conclusion, may I remind you that you are going to have public relations anyway, so they might just as well be good. If they are good, it will make your job easier, as well as far pleasanter. It will give you satisfaction, happiness and peace of heart that money cannot buy.

The one miracle prescription that will be of most benefit in securing good public relations, whether it be international, interstate, interhospital or interdepartmental, is the *Golden Rule*: "Do unto others as you would have them do unto you."

Physicians, Hospitals, and New and Nonofficial Drugs

► INQUIRIES REACHING A. M. A. headquarters reveal considerable confusion concerning the purpose of statements published under the title New and Nonofficial Drugs by the A. M. A. Council on Drugs. Indeed, the Council's statements, which appear regularly in THE JOURNAL and which are available in cumulative annual book form from the J. B. Lippincott Company of Philadelphia, are being interpreted by some persons and organizations as a form of acceptance, approval, or endorsement which is not intended. This erroneous concept apparently also has been used in some instances as a basis for authorization of purchases of hospital medication or allowance of hospital insurance payments for drugs. Undoubtedly a good deal of the misunderstanding stems from the former seal-acceptance program, under which the Council limited its descriptions of drugs to those considered to have well-established clinical usefulness. Accordingly, it is important to point out that the Council's current program for evaluation of drugs is designed to provide information concerning the status of all commercially available individual preparations of new drugs, whether or not clinical usefulness has been conclusively established.

The Council's revised method of operation was instituted in THE JOURNAL in 1955 and in the 1956 edition of its annual publication under the original name of the Council (Council on Pharmacy and Chemistry) and the former title, New and Nonofficial Remedies (New Program of Operation for Evaluation of Drugs, *J. A. M. A. 158*:1170-1171 [July 30] 1955). This circumstance also may account for some of the confusion between the Council's former and current programs. The subsequently instituted change in the name of the Council and revision of the title of its publication, which were made in THE JOURNAL early in 1957 and in the 1958 edition of the book, were designed to further emphasize its new method of drug evaluation and its primary concern with the clinical status of drugs. (Name of Council and Title of Its Annual Publication Changed, *J. A. M. A. 163*:645 [Feb. 23] 1957). Early this year, the introduction to Council statements on New and Nonofficial Drugs appearing in THE JOURNAL was reworded to explicitly disclaim their interpretation as an implied endorsement (Notice of Changes in Operation, *J. A. M. A. 169*:946-947 [Feb. 28] 1959).

It is appropriate to emphasize not only that New and Nonofficial Drugs is not a book of "accepted" or "approved" drugs but also that known trademark names of available brands are included merely as a matter of information to aid in the identification of drugs. The Council does not conduct clinical tests or laboratory analyses of drug preparations, or endeavor to compare the quality of various brands. Rather, the Council undertakes to comment on the proposed actions, indications, limitations, hazards, route of administration, and dosage of drugs, on the basis of existing available scientific data and reports of investigations. The compilation of authoritative information of this kind is designed to aid busy physicians who do not have the time to undertake their own appraisal of drugs. It also should be helpful to medical staffs in selecting drugs for hospital formularies.

One of the fundamental defects of the former seal-acceptance procedure lay in its encouragement of the faulty concept that accepted drugs were all "good" and unaccepted drugs, all "bad." The false sense of security engendered by this concept of acceptance actually fostered a careless attitude in the use of highly potent and effective agents having a narrow margin of safety between therapeutic and toxic levels of dosage. Thus, it became imperative that the Council's program be revised to place primary emphasis on the dissemination of early information, rather than the description of well-established drugs. Use of drugs on the basis of a symbol, such as a seal of acceptance, rather than on the basis of knowledge, should have no place in modern scientific medicine. The Council's current drug evaluation program, together with special reviews of therapy in various clinical disorders, and special reports and symposiums on special therapeutic problems, is aimed toward the encouragement of rational therapeutics as a part of the over-all effort to stimulate the continuing education of physicians.

—EDITORIAL: *J. Am. Med. Assoc. 171*:146/2224 (Dec. 19) 1959.

A S H P

EXECUTIVE COMMITTEE ACTIONS

February 1960 Meeting

► THE 1960-1961 EXECUTIVE COMMITTEE of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS met at the Hotel DuPont Plaza in Washington, D. C. on February 4 and 5, 1960. This constituted the principle meeting of the Executive Committee for the current SOCIETY year. Members of the Executive Committee present were President, Vernon O. Trygstad; Vice President, Jack S. Heard; Chairman of the Committee on Program and Public Relations, Clifton J. Latiolais; Chairman of Committee on Minimum Standards, Grover C. Bowles; Chairman of Committee on Membership and Organization, Louis P. Jeffrey; and Chairman of Committee on Pharmacists in Government Service, Norman E. Hammelman. Secretary Gloria Francke and Treasurer Sister Mary Berenice were absent due to illness. Others participating in parts of the Executive Committee included Walter Frazier, Chairman of the ASHP Committee on Reorganization, Allen V. R. Beck, the ASHP's Delegate to the A.Ph.A. House of Delegates, Don E. Francke, Editor of the AMERICAN JOURNAL OF HOSPITAL PHARMACY, Paul Parker, Director of the Division of Hospital Pharmacy of the A.Ph.A. and the ASHP, Joseph Oddis, Staff Representative of the Council on Professional Practice of the American Hospital Association, R. David Anderson, Chairman of the SOCIETY's Committee on Safety Practices and Procedures, Dr. William S. Apple, Secretary of the American Pharmaceutical Association, Dr. Robert P. Fischelis, past Secretary of the A.Ph.A., George Provost, Secretary of the American Hospital Formulary Service, and Dean Charles Bliven, Chairman of the American Association of Colleges of Pharmacy.

Actions Taken

SOCIETY officers and committee chairmen presented detailed reports and gave consideration to numerous activities. The following is a summary of actions taken:

—Approved sending flowers to Secretary Gloria Francke and Sister Mary Berenice along with regrets of their inability to attend the Executive Committee meeting.

—Disapproved a request from an agency to use the ASHP symbol in connection with advertising.

—Considered correspondence between the American College of Apothecaries and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS regarding the possibility of a joint session at the Annual Meeting in August.

—Considered correspondence from Dean Charles Wilson of Oregon State College suggesting that a committee be set up to study problems relating to inconsistency in pharmaceutical names. (It was agreed that this activity is beyond the scope of the SOCIETY alone. It was suggested that a committee or commission might more appropriately come under the jurisdiction of the American Pharmaceutical Association, with its various sections and affiliates represented.

—Reviewed the status of the SOCIETY's Professional Liability Insurance Program.

—Received notice of Mr. Paul Parker's resignation from the Division of Hospital Pharmacy. Also discussed Mrs. Gloria Francke's expressed wishes to be relieved of the duties of Secretary at an early date. It was agreed that her resignation should be accepted when presented if a suitable replacement is available.

—Accepted a plan as worked out between officers of the American Pharmaceutical Association and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS to create a dual position of Executive Secretary of the ASHP and Director of the Division of Hospital Pharmacy.

—Approved appointment of Mr. Joseph Oddis as Assistant Secretary and Secretary-Nominee of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. (The Executive Committee will place Mr. Oddis' name in nomination for ASHP Secretary to complete the present term at the Annual Meeting in Washington in August.)

—Considered in detail the possibility of establishing a category for student memberships in the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. (Establishment of a category of student membership was not approved by the Executive Committee.)

—Heard report on overall A.Ph.A. activities from Dr. William S. Apple with particular comments on relationships of the A.Ph.A. and the ASHP with reference to the future when the new Headquarters Building is completed.

—Established a membership award to be presented at the Annual Meeting. This award is to be a free three-year membership in the SOCIETY for the member making the greatest contribution toward increase in membership during the year. A.Ph.A. Secretary Dr. Apple also advised that a free membership in the A.Ph.A. for the same period would be awarded the winner concurrently.

—Approved the North Dakota Society of Hospital Pharmacists as an affiliate of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS.

—Approved a proposed questionnaire form for determining the membership interest in committee activity. (This is in carrying out Resolution 14 passed at the 1959 Annual Meeting.)

—Reviewed the Constitution and By-Laws of the New York State Council of Hospital Pharmacists as it relates to the ASHP.

—Reviewed in detail reports on the American Hospital Formulary Service and

1. Approved the Chairman of the Committee on Pharmacy and Pharmaceuticals being given authority to appoint members of the Reference Committee.
2. Asked that plans for promotion and publicity of the Formulary Service be submitted to the Committee on Pharmacy and Pharmaceuticals.
3. Approved appointment of Mr. Edward Hartshorn as a member of the Committee on Pharmacy and Pharmaceuticals. (Mr. Hartshorn has since declined the appointment because of pressure of other work.)

—Reviewed plans for appointment of a Joint Committee of the American Association of Colleges of Pharmacy and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. (Such a committee has been appointed and an initial meeting was scheduled for late in March.)

—Heard comments on recent activities concerning the total profession of pharmacy, particularly the Kefauver hearings, prescription mail orders, etc. Those concerned particularly with these areas included Mr. Vernon O. Trygstad, Dr. William S. Apple, and Dr. Robert P. Fischelis.

—Instructed the Finance Committee to transfer not less than $5,000 this year from the account of the AMERICAN JOURNAL OF HOSPITAL PHARMACY to the account of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS.

—Commended the JOURNAL staff for its outstanding management of the AMERICAN JOURNAL OF HOSPITAL PHARMACY over the past years.

—Recommended that the Committee on Minimum Standards proceed with a draft of a revised Guide for Application and minor changes in the wording of the Standard.

—Authorized the Chairman of the Committee on Radio-Pharmaceuticals to gather information from the sources listed in his report and relate back to the Executive Committee.

—Approved payment by the SOCIETY of expenses of the President, Secretary, and Treasurer to the Annual Meeting of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, beginning in 1960.

—Considered the budget for the current year and referred recommendations and suggestions to the Finance Committee for working out the final budget.

—Heard reports from Dr. William S. Apple, Secretary of the A.Ph.A. regarding status of the Kefauver hearings, recruitment of pharmacists, and other current developments.

—Considered recent comments regarding outpatient prescription service in hospitals. A sub-committee headed by Grover C. Bowles, was appointed to explore the various aspects of the outpatient prescription service problem. Appointed to assist Mr. Bowles is Don E. Francke and Joseph Oddis.

—Approved, with certain recommendations, the following grants (supported by Lederle Laboratories) under the SOCIETY's research and development program:

1. Sister Mary Berenice, St. Mary's Hospital, St. Louis—"Writing an Operational Manual and Pharmacy Residency Program for Pharmacy Departments of St. Mary's Group."
2. Mr. Samuel Kohan, Denver General Hospital, Denver, Colo.—"Studies of Possible Bacterial Contamination in Use of Multiple Dose Vial Medication."
3. Dr. John Autian, College of Pharmacy, University of Michigan, Ann Arbor, Mich.—"The effect of Plastics on Drug Products."
4. Mr. Neal Schwartau, Rochester Methodist Hospital, Rochester, Minn.—"Study of a Proposed Individual Dose Dispensing System for Hospitals."

Additional requests were considered but approval withheld pending further information of submission to the Selection Board for recommended action.

—Considered the program and plans for 1960 Institutes.

—Considered long range plans for conducting institutes and working out further cooperation with the American Hospital Association.

—Considered in detail plans for the specialized institute which is scheduled for October, 1960.

—Heard a report on the actions of the A.Ph.A. House of Delegates by Allen V. R. Beck, ASHP's Delegate to the A.Ph.A.'s House of Delegates.

—Heard detailed reports from officers, chairmen of standing committees and special committees.

as the president sees it—

VERNON O. TRYGSTAD, *Veterans Administration, Washington, D. C.*

► HIGHLIGHTING THE EXECUTIVE COMMITTEE meetings in Washington earlier this year were interim reports from many of the ASHP's Standing and Special Committees. These reports gave proof of the great amount of work and activity already being done this year by committee chairmen and members. This seems to typify the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS—our members willingly contributing their work, time, and talents for the good of all of hospital pharmacy. Evlyn Gray Scott once told me that from the earliest days of the ASHP, when there was something that needed to be done, someone just pitched in and did it. Along with sound leadership and willing workers, this spirit probably is most responsible for the continuing growth and success of the SOCIETY over the years. But there is work yet to be done. Perhaps the one thing greater than the accomplishments of the past in hospital pharmacy is the challenge of the future.

It is not possible to discuss here all of the committee activities now going on. From the midyear "preview," however, I can tell you that it will be well worth while for every hospital pharmacist to look for and study the committee reports which will be presented in brief form at the Annual Meeting and published in full in the JOURNAL. I fully expect each of them to be another step ahead for hospital pharmacy. In view of the interest and renewed emphasis on accidental poisoning recently, it might be timely to mention the work now being done by ASHP's Committee on Accidental Poisoning, headed by Henry L. Verhulst. Hospital pharmacists will recall the work of the Committees on Economic and Household Poisons, forerunner of the current Committee on Accidental Poisoning, in which much pioneering was done. Their reports and those to come will give you much information in this field.

There are many ASHP activities, of course, which are of particular interest predominantly to hospital pharmacists. But there are many other matters which should be of concern to all of pharmacy. For example, every pharmacist should be concerned with the image created in the public view by pharmacists and their pharmacies. In your hospitals, in your pharmacies, in your daily contacts, you have the opportunity to present the professional side of pharmacy as a vital member of the health services team.

There is no segment of pharmacy which will not benefit from the newly launched recruitment program to be coordinated by the American Pharmaceutical Association. The National Advisory Commission on Careers in Pharmacy met in Washington last month, laying the groundwork for coordinated and cooperative recruitment by all of pharmacy. All national pharmaceutical organizations were invited to have representation on the Commission, and most, including the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, are actively participating in this work. Although spearheading and coordinating pharmacy student recruitment activities may be largely a "headquarters" function, every pharmacist should be a recruiter for hospital pharmacy. Much can be accomplished simply by each of us encouraging young people to consider pharmacy, and hospital pharmacy specifically, as an interesting and rewarding career. It can be done most effectively by you, the hospital pharmacist, by your own actions, your own professional attitude and appearance, your own pride in your profession and specialty, setting an example which career minded young people will want to follow. It would be well for each local chapter to plan a recruitment program as a special project. Many have done this through student orientation programs, in which pharmacy students are invited to visit hospitals. Maybe similar programs can be developed with high school counsellors to acquaint high school students with the general field of pharmacy, and hospital pharmacy in particular. You will be hearing more of overall recruitment plans as they are developed. But as it does for many important undertakings, the ASHP will look to and lean heavily on its local chapters to carry out effective recruitment activities, especially in local high schools and colleges within each state.

Congratulations to the North Dakota Society of Hospital Pharmacists and its enthusiastic officers and members on becoming the most recently Affiliated Chapter of the ASHP. It is good to have new members, new groups, new chapters, joining with the staunch, seasoned older groups who have been the backbone of the SOCIETY over the years. As your SOCIETY grows, so will hospital pharmacy.

Vernon Trygstad

Therapeutic Trends

edited by WILLIAM JOHNSON

Severe Hypoglycemia After Ingestion of a Sulfonylurea Compound

This report was prepared from the case history and follow-up of one individual. Past history from army records and previous illness showed this person to have been an aggressive sociopathic individual. This patient received two doses of chlorpropamide (Diabinese), while under medical supervision, after which he passed into a hypoglycemic comatose state. When he came out of the coma, extensive physical and mental tests were performed. The conclusions drawn from the results were: 1. Definite evidence of cortical damage of a diffuse nature as manifested by loss of abstract ability, disorganization of behavior under stress, and marked preservation. 2. Severe damage in the speech areas, i.e., temporal lobes; and 3. Intellectual function at moronic level. This report was prepared by Sackner and Balian and appeared in *Am. J. of Med. 28*:135 (Jan.) 1960. The study in part was carried out under a grant from Pfizer Laboratories.

DALE R. HYDER

Sulfathiazole Lozenges for Prevention of Colds

A special flavored lozenge containing 2.5 grains of sulfathiazole for prevention of colds was formulated. The unique base provides prompt absorption into the interstices of the oropharyngeal mucosa for prolonged local antibacterial action. In a six year field test on 2,327 children and adult counselors at three summer camps, the incidence of colds and other respiratory tract infections was 15.7 percent in the subjects who used the sulfathiazole lozenges as compared with 55.6 percent in the untreated controls. In a series of 1,505 patients seen in private practice, the incidence of colds and other respiratory tract infections was 13.6 percent in the patients who used the sulfa lozenges as compared with 58 percent for the controls. Colds which did develop in those using the lozenges were less severe and of shorter duration than in the controls. Gould and Becker, in *Eye, Ear, Nose and Throat Monthly 39*:58 (Jan.) 1960, state that no untoward effects of the medication were observed in any of the patients. For prophylactic purposes, two lozenges totaling 5 grains of sulfathiazole are effective, and for therapeutic purposes, four lozenges totaling only 10 grains of sulfathiazole per day are needed. These successful results are attributed to the antibacterial action of sulfathiazole on the pathogenic bacteria which often reside in the throat, notably *Streptococcus hemolyticus, Staphylococcus aureus,* and Types I and II *pneumococcus*. These bacteria probably work in symbiosis with the virus of common cold, so as to prolong the period of infection and aggravate the inflammatory symptoms. These lozenges were supplied as Crionil lozenges by Pine Station, Albany, N. Y.

SYLVIA SCHMIDT

Anaphylactic Death from the Use of A Throat Lozenge

Hesch reports in *J. Am. Med. Assoc. 172*:12 (Jan. 2) 1960 a case in which a 24 year old male expired twenty minutes after using a popular throat lozenge, containing 10 mg. of benzocaine, 1 mg. of tyrothricin, and chlorophyll. Prior to using the lozenge the patient was examined for an acute sore throat of some ten hours' duration. There was no respiratory obstruction at this time. Autopsy revealed no foreign material in the mouth, or any open lesions in the oral cavity which might explain direct entry to the blood stream. The larynx exhibited marked edema of the cords, where there was a complete obstruction of the airway. It was felt that death was due to anaphylaxis. It was postulated that the patient may have used lozenges to an extent previously to have acquired a sensitivity to one or more of the ingredients and this final dose precipitated severe anaphylaxis.

DALE R. HYDER

Effect of D. L. Penicillamine on the Urinary Excretion of Copper and Calcium in Hepatolenticular Degeneration

It has been postulated that excessive accumulation of copper in organs such as the liver, brain, and kidneys is responsible for the symptomatology in patients with hepatolenticular degeneration. The substances used to treat this condition may be grouped into three classes—1. Those that decrease the absorption of copper from the gut; 2. Those that increase the urinary excretion of copper; and 3. Those that increase the

concentration of plasma ceruloplasmin. Litin *et al.* conducted a study using eight patients—three healthy males and five patients with hepatolenticular degeneration. The urinary excretion of copper was increased 13 to 35 times in the healthy males and 4 to 17 times in the diseased patients, when D. L. penicillamine was administered in doses of 500 mg. orally three times daily. There seemed to be no significant change in the excretion of calcium in either group. D. L. penicillamine is superior to BAL in its ability to increase excretion of copper and also has the advantage of being an oral medication. The tests also suggest that D. L. penicillamine is effective in mobilizing copper from the tissues. The drug may be useful in the treatment of hepatolenticular degeneration. The study was reported in *Neurology 10*:123 (Feb.) 1960.

RICHARD H. HARRISON

Cavodil in Treatment of Angina Pectoris

Cavodil, *beta*-phenylisopropylhydrazine, is an inhibitor of monamine oxidase. It has prolonged action and the effects of a single dose may last from 7 to 10 days. Mackinnon *et al.* reported the results of a study of Cavodil in the *Brit. Med. J.* page 243 (Jan. 23) 1960. In a double blind study with 28 patients, Cavodil was administered in dosages of 6 mg. twice daily. As a control, a tablet of lactose of the same size and shape was used. The side effects were mild. Eleven of the patients showed improvement on Cavodil alone and 12 showed improvement on Cavodil and control. A composite of 85 percent of the patients treated showed improvement. This was a short trial and a small number of patients. The figures were encouraging however and suggest that further clinical trials are fully justified. The drug Cavodil was supplied by Benger Laboratories Ltd., England.

RICHARD H. HARRISON

Dysmenorrhea—Treatment with Isoxsuprine

In addition to its action on the smooth muscle of blood vessels, isoxsuprine has potent depressant activity on the smooth muscle of the uterus. A clinical evaluation of this new smooth muscle relaxant, isoxsuprine, in the treatment of primary dysmenorrhea has been described by Denis Voulgaris in *Obstet. Gynecol. 15*:220 (Feb.) 1960. Fifty-three patients with a history of severe pelvic cramping as the major symptom of dysmenorrhea received isoxsuprine, 10 to 20 mg. three or four times daily, beginning 24 to 72 hours before the expected onset of menstruation. Isoxsuprine satisfactorily relieved or prevented pelvic cramping in 44 of 53 patients with dysmenorrhea; caused no toxic reactions, and produced no side effects sufficient to discontinue medication. Isoxsuprine had no effect on premenstrual tension or edema. It was supplied as Vasodilan hydrochloride by Mead Johnson and Co.

SYLVIA SCHMIDT

Methylphenidylate in Acute Alcohol Intoxication

Intravenous methylphenidylate (Ritalin) was found to be effective in counteracting alcoholic depression in 80 percent of cases tested by Scogin and Dobson and reported in *Am. Pract. Dig. Treat. II*:48 (Jan.) 1960. Reversal of alcohol depression was valuable in that the patients could be evaluated for other disease or trauma and then released without waiting to "sleep it off." In addition, patients were awake, alert and more cooperative and responsible. Contraindications include excess anxiety, agitation, psychosis and severe cardiovascular disease. The drug should not be used with epinephrine or epinephrine like drugs.

KENNETH W. HUCKENDUBLER

Treatment of Intestinal Gas and Bloating with Methyl Polysiloyane

Methyl polysiloyane acts in the stomach and intestine to change the surface tension of gas bubbles, enabling them to coalase. The free gas thus formed is eliminated more easily than small bubbles by belching or by passing flatus. This silicone is a chemically inert material; it is not attacked by enzymes and does not support bacterial growth. Further studies are in progress. Methyl polysiloyane was supplied as Mylicon by the Stuart Company, Pasadena, Calif. and this work was reported by Rider in *Am. Pract. Dig. Treat. II*: (Jan.) 1960.

KENNETH W. HUCKENDUBLER

Propylthiouracil—Deficiency of Prothrombin and Proconvertin after Therapy

It is suggested that propylthiouracil may, although infrequently, result in a specific impairment of the coagulation system with a deficiency of prothrombin and proconvertin. A hemorrhagic tendency is a rare but serious manifestation of propylthiouracil toxicity. Studies by Kolars and Gonyea as reported in *J. Am. Med. Assoc. 171*:2315 (Dec. 26) 1959 suggest that this bleeding tendency arises from a specific dual deficiency of prothrombin and proconvertin. Vigorous treatment with parenteral administration of phytonadione corrected this deficiency, but repeated administration of this drug was necessary to maintain a normal quick prothrombin time.

DALE R. HYDER

Psicofuranine—Antitumor and Toxicopathological Studies

Psicofuranine was effective in increasing the number of survivors and tumor regressions in rats bearing three different kinds of tumors. This antibiotic was active when given orally to rats with either recently transplanted or established tumors. The structure of psicofuranine suggests that it may act as an antimetabolite in the synthesis of nucleic acids. A relatively low order of toxicity was indicated by acute LD_{50} values in the mouse and rat and subacute toxicity studies in rats and dogs. *Antibiot. and Chemotherap. 9*:675 (1959) carried this report by Evans and Gray.

KENNETH W. HUCKENDUBLER

Timely Drugs

Aldactone

GENERIC AND CHEMICAL NAMES: Spironolactone; 3-(3-oxo-7α-acetylthio-17β-hydroxy-4-androsten-17α-yl) propionic acid-γ-lactone.

INDICATIONS: Aldosterone-blocking agent; specifically blocks effects on kidneys of mineralocorticoids and blocks sodium-retaining effects of aldosterone which is vitally concerned in production and maintenance of edema and ascites of congestive heart failure, hepatic cirrhosis, nephrotic syndrome, idiopathic edema and other conditions. Is particularly useful in relieving edema or ascites refractory or not optimally responsive to conventional diuretic therapy.

SIDE EFFECTS AND CONTRAINDICATIONS: No known contraindications; should be administered cautiously to patients with elevated serum potassium levels. Side effects are mild and infrequent; drowsiness and mental confusion have been observed rarely.

DOSAGE: Average adult, 400 mg. daily in divided doses; may range from 300 to 1200 mg. daily. Maximal effect usually occurs in 4 or 5 days.

PREPARATIONS: Tablets containing 100 mg. spironolactone.

PACKAGING: Bottles of 20 and 200 tablets.

SUPPLIER: G. D. Searle & Co.

Delenar

COMPOSITION: Dexamethasone (Deronil), orphenadrine hydrochloride, and aluminum aspirin.

INDICATIONS: Rheumatism and mild arthritis; also mild or moderate spondylitis, subacute or interval gout, bursitis, low back strain, synovitis, etc.

SIDE EFFECTS AND CONTRAINDICATIONS: Usual precautions for corticoid therapy should be observed.

DOSAGE: Two tablets 4 times daily; dosage should be gradually reduced, and discontinued where possible.

PREPARATIONS: Tablets containing dexamethasone 0.15 mg., orphenadrine hydrochloride 15 mg., and aluminum aspirin 375 mg.

PACKAGING: Bottles of 100 and 1,000 tablets.

SUPPLIER: Schering Corp.

Durabolin

GENERIC NAME: Nandrolone phenpropionate;(norandrostenolone phenylpropionate).

INDICATIONS: To induce weight gain and well-being in pre- and postoperative treatment, retarded growth and development in children; osteoporosis, uremia, cachexia during convalescence, debility states, weight loss, corticoid-induced catabolic effects, myopathies and inoperable mammary carcinoma.

SIDE EFFECTS AND CONTRAINDICATIONS: Contraindicated in prostatic cancer, cardiac failure, hepatic or renal dysfunction; in inoperable mammary carcinoma with extensive metastases, hypercalcemia may develop and thus blood calcium should be determined at weekly intervals or more often.

DOSAGE: For general anabolic effects in adults, 25 mg. weekly, or 50 mg. every 2 weeks; children under 7, 10 mg. or less weekly.

PREPARATIONS: Injection, containing 25 mg. per ml. in sesame oil.

PACKAGING: Ampuls of 1 ml. and vials of 5 ml.

SUPPLIER: Organon, Inc.

Elipten

GENERIC AND CHEMICAL NAMES: Amino-glutethimide; a-(p-aminophenyl)-a-ethyl-glutarimide.

INDICATIONS: For most types of convulsive seizures, particularly petit mal, grand mal, psychomotor and myoclonic seizures.

SIDE EFFECTS AND CONTRAINDICATIONS: Skin rash, sedation, ataxia and mental confusion have been reported. Extreme caution should be exercised when administering to patients with history of allergy.

DOSAGE: Must be individualized. Patients who have received no previous treatment should be started on 125 to 250 mg. once daily, increased by 125 to 250 mg. every 3 to 5 days; average therapeutic dose is 250 mg. 3 times daily. If patient has been on anticonvulsant medication, dosage is the same but when 750 to 1000 mg. daily is reached, other anticonvulsant should be slowly reduced to amount which will maintain control.

PREPARATIONS: Tablets containing 250 mg. amino-glutethimide.

PACKAGING: Bottles of 100 capsules.

SUPPLIER: Ciba Pharmaceutical Products.

Isordil

GENERIC AND CHEMICAL NAMES: Isosorbide dinitrate; 1,4,3,6-dianhydro-sorbitol-2,5-dinitrate.

INDICATIONS: Long-acting coronary vasodilator for therapeutic and prophylactic management of angina pectoris.

SIDE EFFECTS AND CONTRAINDICATIONS: Transitory headache; should be used with caution in patients with glaucoma.

DOSAGE: Orally, 10 mg. taken 30 minutes before meals and at bedtime.

PREPARATIONS: Tablets containing 10 mg. isosorbide dinitrate.

PACKAGING: Bottles of 100 tablets.

SUPPLIER: Ives-Cameron Co.

Librium

CHEMICAL NAME: 7-Chloro-2-methylamino-5-phenyl-3H-1,4-benzodiazepine 4-oxide hydrochloride.

INDICATIONS: Effective in mild to moderate anxiety and tensions, tension headache, pre- and postoperative apprehension, premenstrual tension and menstrual stress, behavior disorders in children, and whenever anxiety and tension are concomitants of gastrointestinal, cardiovascular, gynecologic or dermatologic disorders. In

higher doses, is useful in more severe anxiety and tension states, chronic alcoholism, agitated depression, and ambulatory psychoneuroses.

SIDE EFFECTS AND CONTRAINDICATIONS: Minor side effects have been infrequent and have been readily controlled with reduction in dosage. In elderly, debilitated patients, dosage must be limited to preclude development of ataxia or oversedation. Usual precautions in treating patients with impaired renal or hepatic function should be observed.

DOSAGE: Adults, 10 mg. 3 or 4 times daily; in geriatric patients, 10 mg. once daily; severe anxiety and tension, 20 mg. 3 or 4 times daily; children, 10 mg. once daily.

PREPARATIONS: Capsules of 10 mg.

PACKAGING: Bottles of 50 and 500 capsules.

SUPPLIER: Roche Laboratories.

Maxipen

GENERIC NAME: *a*-Phenoxyethyl penicillin potassium.

INDICATIONS: Usual indications for penicillin. A mixture of the D and L isomers of *a*-phenoxyethyl penicillin potassium affording rapid absorption from gastrointestinal tract and exceptionally high oral serum levels.

SIDE EFFECTS AND CONTRAINDICATIONS: Usual precautions with penicillin therapy should be observed.

DOSAGE: For moderately severe conditions, 125 to 250 mg. 3 times daily; for more severe conditions, 500 mg. as often as every 4 hours around the clock. In beta hemolytic streptococcal infections, treatment should be continued 10 days to minimize danger of rheumatic fever or acute glomerulonephritis.

PREPARATIONS: Oral solution, when reconstituted, containing 125 mg. per 5 ml.; tablets containing 125 mg. or 250 mg.

PACKAGING: Solution, oral, when reconstituted, bottles of 60 ml.; tablets 125 mg., bottles of 36; tablets 250 mg., bottles of 24 and 100 tablets.

SUPPLIER: J. B. Roerig and Co.

Miradon

GENERIC NAME: Anisindione, an indandione derivative.

INDICATIONS: In the treatment and prophylaxis of all pathological conditions of arterial and venous clotting, including thrombophlebitis, phlebothrombosis, arterial embolism or thrombosis, pulmonary embolism secondary to intravascular clotting, and coronary occlusion with myocardial infarction. Prophylactic indications include traumatic injury to blood vessels, vascular surgery, pelvic and extensive surgery, and postpartum cases with history of thrombophlebitis.

SIDE EFFECTS AND CONTRAINDICATIONS: Use should be controlled by periodic prothrombin-time determinations. Therapy should be interrupted or discontinued if hemorrhage occurs. Contraindicated when danger of hemorrhage is greater than that of thrombosis or embolism and should not be used in presence of hemophilia, thrombocytopenic purpura, leukemia with pronounced bleeding tendency, impaired hepatic or renal function, acute nephritis.

DOSAGE: Initially, 300 mg. first day, 200 mg. second day and 100 mg. third day. Maintenance dose, 75 to 100 mg. daily.

PREPARATIONS: Tablets containing 50 mg. anisindione.

PACKAGING: Bottles of 100 tablets.

SUPPLIER: Schering Corp.

Oxaine

COMPOSITION: Alumina gel containing oxethazaine [N,N-bis-(N-methyl-N-phenyl-t-butyl-acetamido)-beta-hydroxyethylamine].

INDICATIONS: For management of chronic gastritis, chronic esophagitis without stricture, and the irritable bowel syndrome.

SIDE EFFECTS AND CONTRAINDICATIONS: In case of overdosage, some patients may experience dizziness, faintness or drowsiness. Constipation may be aggravated by therapeutic doses, which may be mitigated by adequate fluid intake and use of dietary roughage or a mineral oil preparation. In patients with protracted or recurrent indigestion, possibility of gastrointestinal carcinoma should be considered.

DOSAGE: Recommended adult dosage, one or two teaspoonfuls 4 times daily, 15 minutes before meals and at bedtime. Dosage should not be exceeded.

PREPARATIONS: Each 5 ml. alumina gel contains 10 mg. oxethazaine.

PACKAGING: Bottles of 12 fluid ounces.

SUPPLIER: Wyeth Laboratories.

Quadrinal Suspension

COMPOSITION: Ephedrine hydrochloride, phenobarbital, theophylline-calcium salicylate (Phyllicin), and potassium iodide.

INDICATIONS: In respiratory embarrassment caused by bronchospasm and obstruction of airways by tenacious secretion; in bronchial asthma, chronic bronchitis, pulmonary fibrosis, and pulmonary emphysema.

SIDE EFFECTS AND CONTRAINDICATIONS: Caution is indicated with patients sensitive to iodides, in hyperthyroidism, and cardiovascular disease.

DOSAGE: Adults and children over 12 years, two teaspoonfuls 3 times daily; children 6 to 12 years, one teasponful 3 times daily; children under 6, dosage is adjusted according to body weight. (5 ml. of suspension is equivalent to ½ tablet Quadrinal.)

PREPARATIONS: Suspension containing in each 5 ml.: ephedrine hydrochloride 12 mg.; phenobarbital 12 mg.; theophylline-calcium salicylate 65 mg.; and potassium iodide 160 mg.

PACKAGING: Pint bottles.

SUPPLIER: Knoll Pharmaceutical Co.

Rela

GENERIC AND CHEMICAL NAMES: Carisoprodol; N-isopropyl-2-methyl-2-propyl-1, 3-propanediol dicarbamate.

INDICATIONS: Analgesic and muscle relaxant, indicated in those conditions of the musculoskeletal system characterized by pain, stiffness and spasticity such as muscle spasm, lumbosacral strain, sacroiliac strain, bursitis, tenosynovitis, fibrositis, etc.

SIDE EFFECTS: Occasionally, patients may become sleepy; should be discontinued if symptoms of hypersensitivity such as skin rash occur.

DOSAGE: Adults, 0.35 Gm. 3 times daily and at bedtime.

PREPARATIONS: Tablets of 0.35 Gm.

PACKAGING: Bottles of 30 tablets.

SUPPLIER: Schering Corp.

Thiosulfil Forte

GENERIC NAME: Sulfamethizole.

INDICATIONS: For long-term therapy in urinary tract infections, especially those complicated by urinary stasis.

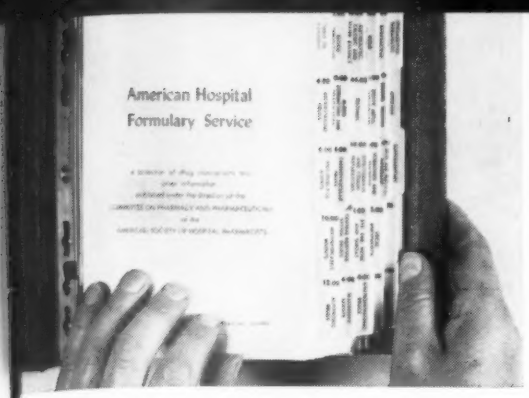
SIDE EFFECTS AND CONTRAINDICATIONS: Usual precautions exercised with sulfonamides should be observed.

DOSAGE: Suggested dosage, 0.5 to 1 Gm. 3 or 4 times daily depending on severity of condition.

PREPARATIONS: Tablets containing 0.5 Gm. sulfamethizole.

PACKAGING: Bottles of 100 and 1,000 tablets.

SUPPLIER: Ayerst Laboratories.



AMERICAN HOSPITAL FORMULARY SERVICE

edited by WILLIAM HELLER, *Chairman ASHP Committee on Pharmacy and Pharmaceuticals*

Your Suggestions Invited

► IT IS RECOGNIZED THAT THERE ARE TWO USES OF the *American Hospital Formulary Service*: (1) as the basis for preparing a hospital formulary and (2) as a comparatively complete drug reference. Attempting to guide the supplement service to fulfill both functions creates some problems.

In deciding which drugs to include in the supplements, we are guided primarily by the likelihood of the drug being used in hospitals and included in hospital formularies. This is sometimes a difficult decision, and it would be interesting to know how many of our 7000-odd subscriptions are being used *in toto* as reference books and how many are being adapted as hospital formularies.

The Committee on Pharmacy and Pharmaceuticals, which determines the policies of the *Formulary Service*, does not serve as a selecting agency. Regardless of the Committee's opinion of the merits of a particular drug, we feel obligated to issue a monograph to help ensure its safe use in subscribing hospitals. We do not "accept" drugs into the *Formulary Service*. Thus there is no connotation of endorsement in the issuance of a monograph.

To fulfill the former function, that of using the *Service* as a basis for preparing a hospital formulary, monographs need to be as complete and accurate as possible. If the book is to serve *in toto* as a drug reference, monographs should be provided as soon as possible. These two functions work against each other to some extent because information on new drugs is preliminary and often leaves much to be desired. As a rule, we try to issue a monograph as soon as possible and as soon as there is sufficient information available to prepare one, and then to provide later a revised monograph if a revision is deemed necessary.

Your suggestions as to which drugs to include in the supplement service are always welcome. The more we know about the needs of our subscribers, the better we can serve them. There are many older drugs, which may still be widely used, for which monographs have not been prepared. We would also be interested in knowing which of the existing monographs you are not using or which you feel are not needed. When the complete book is reprinted, we expect to delete monographs for those drugs which are no longer used in hospitals.

Fourth Supplement

► THE FOURTH SUPPLEMENT to the *American Hospital Formulary Service*, a 32-sheet supplement, was mailed to subscribers in February. New, more distinctive envelopes were used and each supplement was mailed in a separate envelope. Monographs on the following drugs were included in this supplement:

benoxinate hydrochloride 52:16
benztropine methanesulfonate 12:08
betazole hydrochloride 36:36
bisacodyl 56:12
brompheniramine maleate *and* dexbrompheniramine maleate 4:00
butabarbital sodium 28:24
carbarsone 8:04 and 8:32
chlorpheniramine maleate *and* dexchlorpheniramine maleate 4:00
chymotrypsin, *alpha*-chymotrypsin 44:00, 52:36 and 84:36
coconut oil 40:20
corn oil 40:20
cyclizine hydrochloride 56:20
dextro pantothenyl alcohol, calcium pantothenate 84:16 and 88:08
fibrinolysin (human) 44:00
isoxsuprine hydrochloride 24:12 and 86:00
penicillinase 44:00
phenformin 68:20
pheniramine maleate 4:00
plasma protein fraction (human) 16:00
prednisolone 52:08
titanium dioxide 84:24.12
zoxazolamine 12:20

Subscriptions To 1960 Supplements

► SUBSCRIPTIONS to the Formulary Service are for the calendar year. Subscriptions entered after 1 January 1960 will receive supplements for 1960 without additional charge. Subscriptions entered prior to 1 January 1960 have been invoiced at the following rates for the 1960 supplements:

1-9 copies: $5.00 per subscription
10-24 copies: $4.75 per subscription
25 and over: $4.50 per subscription

So that subscribers will not be inconvenienced, all subscriptions will receive the Fifth Supplement, which is scheduled for distribution in April.

Those subscribers using the *American Hospital Formulary Service in toto* as a complete reference on drugs will need a second binder for each subscription. Additional binders may be ordered at the same time for $4.00 each.

Pharmacy-Central Sterile Supply Services

edited by MILTON W. SKOLAUT, *Chief, Pharmacy Department, Clinical Center, Bethesda, Maryland*

► THIS IS THE FIRST OF A NEW SERIES OF ARTICLES concerning Pharmacy and Central Sterile Supply Service. Hospital personnel have felt the need for more information concerning the relation between the dispensing of drugs and issuing of Central Sterile Supply items. These two services are interrelated in many ways and of great interest to the hospital administrator, the professional staff, and the procurement personnel. These two services should provide drugs and supplies to complement each other.

It is not the intention of the author to resolve the question, "Should Pharmacy or Nursing operate the Central Sterile Supply Service?" In certain areas, the advantages or disadvantages of each will be discussed, but the eventual answer must be reached by each institution, based upon its facilities, operational policies, available personnel, and other factors.

The author hopes to show the importance of purchasing supplies and equipment, based upon the complete patient needs, and not on likes or dislikes of the Pharmacy or Central Sterile Supply. Supplies must be obtained which will make available to the professional staff one complete package of medication and central service material.

Little history of the Central Sterile Supply has been reported in one publication. It can, however, be obtained and pieced together from many sources and bits of information. A complete history of the origin and development of the Central Supply Service cannot be presented in this column. However, many of the interesting points and important developmental trends can be presented. To present historical facts without including development of equipment and packaging techniques would be very difficult and, therefore, they will be combined since each influences the other.

The earlier history will be concerned with processing and sterilization techniques which eventually established the need for standardized processing and sterilization techniques. Standardized packaging is one of the primary functions of the Central Sterile Supply activity, thereby releasing other professional personnel for direct patient care.

Following are some more of the interesting developments in the eventual emergence of the present Central Sterile Supply Services.

MILTON W. SKOLAUT is Chief, Pharmacy Department (includes following Services: Pharmacy, Central Sterile Supply, Pharmaceutical Development and Radiopharmaceutical), The Clinical Center, National Institutes of Health, Public Health Service, U.S. Department of Health, Education, and Welfare, Bethesda, Maryland.

Early Dressings

In an article entitled "Hospital Service, 6000 Years Old" by Anna L. MacGachen, Superintendent, St. Mary's Hospital, Patterson, Louisiana, she states that "the earliest dressings for wounds were green leaves, later on skins or coarse cloths leading up to the surgical dressing of the present day. Wounds were treated in many strange ways, washed with gin, boiled oil, rubbed with salt; application made of snakes, toads, and many other disgusting things. In ruins 1500 years old surgical instruments were discovered, and in Pompeii, not only instruments, but the remains of well constructed and equipped hospitals."[1]

The director of a European hospital reported that they had been using dressings a second time for over 20 years. "There was at first much opposition to this practice and even now there are some that oppose it." He reports further that there is no doubt as to the aseptic condition of the reused dressings. In 1928, 8000 kilograms of dressings were cleansed and resterilized, a savings of $13,000 was realized.[2]

An item of interest in sterile supply history is a book prepared by Nellie A. MacKenzie, in 1917, called "Standard Surgical Dressings." Mrs. MacKenzie was the instructor of classes for the making of surgical dressings of the National Civics Federation, Women's Department. This 42 page booklet gave full instructions on how to properly prepare dressings and the material from which they should be made. This was the first book to give detailed standardization information for surgical dressings. It further assisted in the setting of specifications for the manufacture of dressings.

Sterilization of Rubber

Dr. F. J. Cotton, in the *British Medical Journal* of 1902, recommended two methods of sterilizing gum elastic catheters and bougies. First, by boiling in a saturated solution of ammonium sulfate and second by boiling in sodium chloride solution. He claimed that all gum elastic catheters, bougies, and filiform bougies usually could be boiled repeatedly and for long periods without essential damage. He believed these methods may remove the reproach of gum

elastic instruments from the standpoint of sterility.[3] Metal catheter instruments were in general use at that time in both Great Britain and the United States. The newer gum elastic materials were not received too favorably.

In 1902, Miss Margaret P. Pridham of the Massachusetts General Hospital described how surgical rubber gloves were prepared. After use they were immediately placed in a pail of tepid water to which washing soda was added. Later, the gloves were laid on a slab and scrubbed with a fairly stiff brush in a weak soda solution. After rinsing and drying they were powdered with talc or soap stone powder. They were packaged by rolling in a towel, after securing the folded glove tops, and boiling for ten minutes.[4] It is of interest that usually four pairs of gloves were prepared and required for each operation.

Sterilization of Catgut

A new method for packaging and sterilization of catgut was described in the *New York and Philadelphia Medical Journal* in 1904. The catgut was coiled upon a glass core and placed into a solution of 1 part of iodine tincture and 15 parts of spiritus vini. This produced a gut which was sterile, was not brittle, did not tear or break, could be easily knotted, and was kept in perfect condition for at least a year.[5]

In 1905, F. W. Johnson described another method for sterilizing catgut in the *Boston Medical and Surgical Journal.* The white, defatted gut was wound on wide reels soaked in a solution of 1 pint of iodine, and 99 parts of saturated potassium iodide solution. The writer described this method as providing absolutely sterile gut.[6]

These are two examples of sterile preparation and packaging of catgut sutures. These methods become very interesting when compared with present and with other methods of packaging and sterilization, the newest being radiation sterilization.

Dr. Gusseff described in the *Centralblatt fur Gynakal,* a method for sterilizing 10 to 12 catheters at one time. He used a nickel tube, 12 mm. in diameter and 21 cm. in length, plugged with cotton at both ends. In this was placed 10 to 12 nickel catheters. They were autoclaved and sterilized under pressure, or sterilized by means of dry heat. In this tube sterile catheters could be kept on hand.[7]

Hypodermic Needles and Blades

The *American Journal of Nursing* of 1906 carried a column on contributed practical suggestions. One suggestion was a very simple way to sterilize a hypodermic needle or anything of the kind. The method suggested was to boil it in a small test tube over a flame. Metal utensils were to be sterilized in an emergency by putting them in alcohol, which was ignited and allowed to burn itself out.[8] Both of these methods were dropped in a centralized service, since one controlled method of processing was, and is, used throughout.

Another practical suggestion was advanced in 1907 concerning the sterilization of cutting instruments. The blades were scrubbed with green soap, then wrapped with sterile cotton saturated with tincture of green soap. The wrapping was allowed to dry and just before using the blade it was dropped into boiling water.[9]

In the October 18, 1924 issue of the *Boston Medical and Surgical Journal* there is a report concerning the use of 70 percent alcohol for sterilizing scalpels, scissors and Bard Parker blades. The conclusion was that these instruments should be sterilized by immersion in boiling water for 20 minutes. Further, it was decided to discard all Bard Parker blades after use.

Chemical sterilization versus autoclaving is continuing to be a controversial point. It appears that this problem existed 25 years ago as well as today. The autoclaving equipment and surgical instruments have both improved to make sterilizing simpler in most instances.

Standardized Sets

An example of prepared, standardized sets was demonstrated in 1903 at the Presbyterian Hospital in New York City. It was a hypodermoclysis set developed for operating room use by Miss A. F. Bussel, Head Nurse of the Accident Ward. The castered stand for the solutions also contained two shelves holding all the equipment needed. A mercury bichloride solution, 1-1000, was used to sterilize the physicians' hands, and the thermometer and syringe were disinfected with carbolic acid, 5 percent, and drying.[10] The literature is filled with examples of standardized sets, trays and procedures being developed by professional personnel at the turn of the century.

Miss Alice Shepard Gilman, Assistant Superintendent of Nurses, Rochester General Hospital, prepared an article in 1918 concerning the standardization of equipment.[11] This hospital had not officially established a Central Sterile Supply Service, but the standardization of equipment throughout the hospital was a real step forward and is now being carried on in all hospital Central Services.

Miss Mary L. Keith of the Rochester General Hospital, Rochester, N. Y., authored an article entitled, "Purchase and Installation of Standard Equipment" in 1919. She described methods used in determining needs for standard equipment and how to determine types of equipment and materials needed. Mention was made of standardized dressings in a surgical supply room which was in charge of a registered nurse. This is the earliest reference obtainable of a hospital op-

5. Hitch, J.M.: Neurotoxic Symptoms Following Use of Asterol Dihydrochloride: Report of Three Cases, *J.A.M.A. 150*:1004, 1952.

7. Featherston, W.M.: Convulsions Following Use of Asterol Dihydrochloride: Report of a Case, *J.A.M.A. 150*:1006, 1952.

8. Pirk, L.A. and Sevringhaus, E.L.: Correspondence, *A.M.A. Arch. Dermatol. Syphil. 67*:519, 1953.

9. *New and Nonoffical Drugs,* J. B. Lippincott Co., Philadelphia, 1959, p. 132.

10. *Physicians' Desk Reference to Pharmaceutical Specialties and Biologicals,* 14th ed., 1960, Medical Economics, Inc., Oradell, New Jersey, p. 788.

11. Morton, K.: Convulsions Following Diamthazole (Asterol), *A.M.A. J. Dis. Child. 99*:109, 1960.

Neurotoxic Effects Accompanying Poisoning from the Phenothiazine Tranquilizers

► PERHAPS THE MOST ALARMING OF THE TOXIC effects associated with acute poisoning from the phenothiazine tranquilizers [e.g. chlorpromazine (Thorazine), promazine (Sparine), prochlorperazine (Compazine), perphenazine (Trilafon), and mepazine (Pacatal)] are the severe neurological manifestations sometimes referred to as an "extrapyramidal syndrome." These reactions may consist of recurrent episodes of marked drowsiness and lethargy, drooling, fixed stare, oculygyric crises, retraction and spasms of the neck, trismus, opisthotonos, and sometimes flexor rigidity and hyperreflexia.[1,2] It appears that children are particularly susceptible to this toxicity of the phenothiazines. The labile nervous system of children has been suggested as a possible reason for this susceptibility.[3]

The similarity of the neurological reactions resulting from the phenothiazine-type tranquilizer to those accompanying certain disorders involving the central nervous system has resulted in diagnostic confusion.[3,4] For example, severe retractional and rotational spasms of the neck have led to confusion with meningitis. Trismus has suggested tetanus. Posterior-hindbrain signs such as speech, swallowing and respiratory difficulties (laryngospasm) have indicated diagnoses of bulbar poliomyelitis and led to preparations for tracheotomy. Marked opisthotonos with extensor spasm of the extremities has been interpreted as decerbrate rigidity.[2] Nelson[2] has suggested that "diagnostic confusion may be cleared by consideration of phenothiazine intoxication in any patient with an intact sensorium and the acute onset of severe and unusual extrapyramidal and bulbar signs (particularly fixed stare, drooling, trismus, opisthotonos, and shoulder-girdle spasms)". An example of a case history recently reported in the literature[1] which would tend to support this view is as follows:

> A seventeen-month-old boy was admitted to a hospital because of drowsiness and opisthotonos. The patient had been well until 4½ hours prior to admission, when it was noticed that the child's head was "drawn back and pulled to one side." The child then fell to the floor, but was not unconscious. The episode lasted only a few minutes and the child appeared normal except for drowsiness, which lasted an additional 5 to 10 minutes. Another episode occurred in 30 minutes. Shortly after admission to the hospital, 2 additional attacks of opisthotonos and drowsiness were observed within a 30 minute period. The mother was questioned as to whether she had given the child a tranquilizer or whether such a drug was present in the home. The mother opened her purse and found an empty bottle which had contained several 5 mg. prochlorperazine (Compazine) tablets. Only a few of the tablets were found loose in the purse. The mother had recalled that the child had been playing with her purse 2 hours prior to the onset of his episode.

A simple, rapid chemical test which may aid in the detection of phenothiazine toxicity is the ferric chloride test reported by Forrest *et al.*[5] A test solution consisting of 4 parts of 10 percent sulfuric acid with 1 part of 5 percent ferric chloride solution is employed in this test. Equal volumes of urine and the test solution (e.g. 1 ml. of each) are mixed in a test tube. The rapid formation of a color varying from light to dark violet is indicative of the presence of a phenothiazine derivative. The violet color is considered to be due to the reaction of a relatively unstable metabolite of the phenothiazine tranquilizer with ferric ions in an acid medium.[5] The low *p*H of the test solution is said to establish an acidity at which no interference by salicylates, such as aspirin, is possible.[5] A slight modification of the ferric chloride test used to detect the presence of a metabolite of a phenothiazine tranquilizer in the urine has been recently reported.[6]

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5. Forrest, F.M., Forrest, I.S., and Mason, A.S.: A Rapid Urinary Test for Chlorpromazine, Promazine and Pacatal: A Supplementary Report, *Am. J. Psychiat. 114*:931, (Apr.) 1958.

6. Vesell, E.S.: Urinary Test for a Metabolite of Prochlorperazine, *New Eng. J. Med. 260*:1078 (May 21) 1959.

News

Oddis Accepts Position at A.Ph.A. Headquarters

Joseph A. Oddis of Chicago, Illinois, has recently been named Director of the Division of Hospital Pharmacy at A.Ph.A. Headquarters in Washington. He will assume the role of Assistant Secretary of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, effective June 1, 1960. The announcement was made recently in a joint statement by ASHP Secretary Gloria Francke and Dr. William S. Apple, Secretary of the American Pharmaceutical Association. Mr. Oddis' headquarters will be at the American Institute of Pharmacy in Washington, D. C.

In his role as Director of the A.Ph.A. Division of Hospital Pharmacy, Mr. Oddis will replace Mr. Paul F. Parker, who has resiged this position, effective March 31, to return to hospital pharmacy practice.

Mr. Oddis is a native of Pennsylvania and was gradated from Duquesne University School of Pharmacy in 1950. Since 1950 he has served as the Staff Representative for the Council on Professional Practice of the American Hospital Association. Prior to this he practiced hospital pharmacy as a staff pharmacist at Mercy Hospital in Pittsburgh and later as Chief Pharmacist at the Western Pennsylvania Hospital, also in Pittsburgh. He has been with the Council on Professional Practice since 1956. In this capacity he has worked actively with the Joint Committee of the A.H.A. and the ASHP and served as coordinator of the annual institutes on hospital pharmacy.

Mr. Oddis is an active member of the American Pharmaceutical Association as well as the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, Rho Chi, national pharmaceutical honorary, a Fellow of the American Association for the Advancement of Science, and a member of the American Institute of the History of Pharmacy.

In the ASHP, Mr. Oddis has served on numerous committees and was active in the Western Pennsylvania Society of Hospital Pharmacists when he was located in Pittsburgh. He is currently active in the Illinois Society of Hospital Pharmacists in Chicago. He has filled numerous speaking engagements throughout the country and has actively participated in hospital activities as well as pharmaceutical.

Parker Accepts Kentucky Position

Paul F. Parker, Director of the Division of Hospital Pharmacy of the American Pharmaceutical Association and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS since 1956, has accepted a position as Director of Pharmacy Service and Central Supply at the new University of Kentucky Medical Center in Lexington. He will also serve as Assistant Professor of Pharmacy at the University of Kentucky School of Pharmacy. Mr. Parker is a Past President of the ASHP and has served the SOCIETY in many capacities. He holds a Bachelor of Science degree and a Master of Science degree from the University of Michigan College of Pharmacy, and served an internship in hospital pharmacy at the University of Michigan Medical Center.

Prior to accepting the position as Director of the Division of Hospital Pharmacy, Mr. Parker was Chief Pharmacist at the University of Chicago Clinics where he was largely responsible for reorganizing the Pharmacy Department.

On leaving the Division, in which capacity he was closely associated with ASHP affairs, Mr. Parker has expressed a continuing interest and support of activities of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS.

Conley Joins Hoffmann-La Roche

Bernard E. Conley has recently accepted a position as medical research consultant to Hoffmann-La Roche, Inc. with offices in Chicago. Dr. Conley, a pharmacist, has resigned as Director of the Committee on Toxicology of the American Medical Association. He has been with the AMA for twelve years, during which time he helped to develop and influence the program of the Association's Committees on Toxicology and Pesticides. These programs received an award for outstanding public service from the National Safety Council and commendations from several other national organizations for achievements in the prevention of accidental poisoning.

Dr. Conley received his Ph.D. in pharmacology from the University of Chicago. Before coming to the AMA, he served as regional director of pharmacy service for the Veterans Administration in Ohio, Michigan and Kentucky.

Dr. Conley is a member of the American Pharmaceutical Association and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS and has participated in several ASHP meetings as well as served on committees.

► MRS. MARJORIE MOBURG COGHILL, a former hospital pharmacist and a member of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, has recently been appointed a special assistant to the American Pharmaceutical Association's Division of Communciations. In this position, she will concentrate her activities on the recruitment program and the recently organized Commission on Careers in Pharmacy. Mrs. Coghill at one time served as chief pharmacist at the Illinois Masonic Hospital in Chicago. She was active

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in the SOCIETY over a period of years. Mrs. Coghill is a graduate of the State University of Iowa College of Pharmacy and has done graduate work in hospital administration.

► WEST CHEMICAL PRODUCTS, Inc., Long Island City chemical specialties manufacturer, has recently acquired the Vitarine Company, Inc., of New York and will expand into the drug and allied products field.

► THE NORTH DAKOTA SOCIETY OF HOSPITAL PHARMACISTS has been accepted as the fifty-second affiliate of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. Official acceptance by the Executive Committee was announced at a February meeting of the North Dakota Society.

► REPRESENTATIVES of the American Association of Colleges of Pharmacy and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS met for the purpose of organizing a Joint Committee of the AACP and the ASHP on March 29 in Washington, D. C. Representatives of the AACP include W. E. Weaver, Medical College of Virginia School of Pharmacy, Richmond; William Tester, University of Iowa Hospital, Iowa City; and Dwight Deardorff, University of Illinois College of Pharmacy, Chicago. Representatives of the ASHP include Herbert L. Flack, Jefferson Medical College Hospital, Philadelphia; Don E. Francke, University of Michigan Medical Center, Ann Arbor; and Charles G. Towne, Veterans Administration Center Los Angeles. AACP President Charles Bliven and ASHP President Vernon O. Trygstad were also present for the Washington meeting.

Pharmacologist is 1960 Rennebohm Lecturer

Dr. Ewart A. Swinyard, noted pharmacologist, Professor of Pharmacology and Director of Pharmaceutical Research, University of Utah College of Pharmacy, Salt Lake City, Utah, has been invited to give this year's Rennebohm Lectures at the University of Wisconsin School of Pharmacy. Dr. Swinyard will speak March 24 on the subject: "Drugs: From Animals to Man," and March 25, on "Experimental Seizures and Research."

The Rennebohm Lectures, supported by a grant from the Oscar Rennebohm Foundation, each year bring to the Madison campus for a pair of lectures an outstanding scientist in some area of pharmacy.

Dr. Swinyard did his undergraduate work at Utah State Agricultural College, Purdue University, and Idaho State College, before receiving his M.S. degree from the University of Minnesota, and his Ph.D. from the University of Utah, with a major in pharmacology.

He taught pharmacology at Idaho State College (1936-47) before assuming his present position at the University of Utah in 1947.

Dr. Swinyard's special fields of activity have centered about: arsenical chemotherapy; body water and electrolyte distribution; experimental therapy of convulsive disorders; assay of anticonvulsant drugs; and the relationship between the chemical structure and pharmacological activity of anticonvulsant drugs.

► MILTON N. STAMATOS has been appointed manager of the Hospital Department, McKesson and Robbins, Inc., according to an announcement by Henry H. Henley, Jr., Executive Vice President. Mr. Stamatos, formerly sales manager at the company's Boston Drug Division, has served in McKesson sales since 1952. A member of the American Pharmaceutical Association and Kappa Psi, pharmaceutical fraternity, he received his A.B. degree from Harvard in 1946. He also holds a B.S. degree from the Massachusetts College of Pharmacy.

► SISTER GLADYS ROBINSON, Milwaukee Hospital, Milwaukee, Wisconsin, has been named a member of the State Advisory Council and the Advisory Committee on Hospital Regulation. Sister Gladys Robinson has been active in the Wisconsin Society of Hospital Pharmacists over a period of years and served a term as treasurer of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS.

New York State Council of Hospital Pharmacists

The New York State Council of Hospital Pharmacists met on December 4 and 5 at Albany Hospital, Albany, N. Y. Fourteen members representing the five Affiliated Chapters in New York State were present at this, the first two day meeting held by the Council.

A Constitution and By-Laws for the group was formulated. This consumed all of the first afternoon's session and was not completed until the morning of the second day. A point of major significance was the fact that a permanent title for the Council was arrived at. It is to be the "New York State Council of Hospital Pharmacists." The Constitution and By-Laws are to be distributed to the five Affiliated Chapters represented, encouraging each to adopt similar Constitution and By-Laws.

The major portion of the time remaining was devoted to completing eleven definitions that are to be submitted to the New York State Board of Pharmacy. These are to put the Council and the Board on common ground during their further discussions. Mr. Louis Jeffrey, Chairman of the Council, is to submit these definitions to the Board no later than January 1, 1960.

Chairman Jeffrey suggested that consideration be given to a New York State Hospital Pharmacy Seminar to replace the numerous seminars now being conducted throughout the State. It would take place in a year or two and if successful would be continued.

The next meeting of the Council will be held on April 29 and 30 in Albany, the hospital to be announced.

Historical Display Unit Issued

The American Institute of the History of Pharmacy announces completion of a new type of historical project, a window display unit designed for maximum flexibility and for exhibit under a variety of circumstances. Collaborators on the project were George B. Griffenhagen of Washington, D. C., and the Smithsonian Institution.

The unit consists of ten display cards, 9 by 12 inches, and a five-page illustrated brochure full of suggestions and ideas for making most effective use of the material. Non-members may obtain the display for three dollars postpaid. New members of the Institute (five dollars dues) may receive the display unit as one of the initial membership benefits.

The ten cards, on one side, carry out the theme of the evolution of drug containers. The reverse side of the cards provides a second display on the theme of the history of equipment commonly used by the pharmacist. Either antique or modern pieces of equipment may be selected to exhibit with the cards.

Early reactions confirm that the display unit provides the basis for an unusually effective professional exhibit, completely adaptable to space requirements, and suitable for the pharmacy, hospital, school, or any public exhibition space, according to Dr. Glenn Sonnedecker, Institute Director. Inquiries about the display should be addressed to the AIHP office, 356 Chemistry Building, Madison 6, Wis.

► THE AMERICAN SOCIETY of Pharmacognosy has announced the following officers and committee members to serve for the 1959-1960 term: *President,* Varro E. Tyler, Jr.; *Vice-President,* Norman R. Farnsworth; *Secretary,* Frank L. Mercer; and *Treasurer,* Frank A. Crane. Members of the Executive Committee are Edward P. Claus, Carl H. Johnson, and David Carew.

► A NEW LABORATORY TEST, developed by Dr. Albert Coons of Harvard Medical School, will enable physicians to diagnose and begin treatment of streptococcal infections within 2-3 hours. Former tests for streptococcal infections, which often lead to rheumatic fever and rheumatic heart disease, took 2-3 days. By enabling physicians to begin necessary antibiotic therapy two days earlier, reports the Health News Institute, we may be able to eradicate the strep infection before rheumatic fever and rheumatic heart disease develop—diseases, which cause the deaths of about 20,000 people each year.

► FOR THE FIRST TIME since the introduction of the Salk polio vaccine in 1955, there has been a sharp increase in the incidence of polio, particularly the paralytic type. Approximately 4,000 cases of paralytic polio were reported to the U. S. Public Health Service as of October 3, more than twice as many as were reported for the same period in 1958.

According to the National Foundation, much of this was needless, because "The vast majority of paralytic cases occurred among those with fewer than three polio shots." U. S. Public Health Service figures show that unvaccinated children were stricken with paralytic polio more than 10 times as often as were children who had the full series of three Salk polio shots.

Bishop James A. McNulty of Peterson, N.Y., presents a plaque to Sister Eileen Teresa, Administrator of St. Mary's Hospital, Passaic, N. J. The plaque was presented in honor of the institution's service to the Community in filling a million prescriptions. The Award, sponsored by Lederle Laboratories, was presented on January 12 at the dedication of a new pharmacy and retarded children's Clinic at the Hospital. Looking on are Joseph Caste, Lederle representative and Ludwig Pesa (right) pharmacist at St. Mary's for twenty years

SELECTED PHARMACEUTICAL ABSTRACTS

and summaries of other articles interesting to hospital pharmacists

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edited by CLIFTON J. LATIOLAIS, HENRY J. DEREWICZ *and* LEO F. GODLEY

FLUORIMETRIC DETERMINATION OF ADRENALIN AND NORADRENALIN

On the Fluorimetric Determination of Adrenaline and Noradrenaline, Canback, T., Harthan, J. G., J. Pharm. Pharmacol. 11:764 (Dec.) 1959. (Apoteket Ugglan, Stockholm, and Research Laboratories, AB Bofors, Nobelgrut, Bofors, Sweden.)

A modification of the fluorimetric method for the determination of adrenaline and noradrenaline in pharmaceutical solutions is described. In this method, sulphite present is destroyed with iodine, the added excess of which is reduced with arsenous acid, a manipulation which does not affect the fluorescence obtainable.

AUTHOR'S SUMMARY

ANTIBACTERIAL ACTIVITY OF MERCURIC CHLORIDE

The Antagonism of the Antibacterial Action of Mercury Compounds, Part II, Factors Affecting the Action of Mercuric Chloride, Cook, A. M., Steel, K. J., J. Pharm. Pharmcol. 11:729 (Dec.) 1959. (Department Pharmaceutics, School of Pharmacy, University of London, Brunswick Square, London, W. C. 1.)

In Part I, the antibacterial activity of mercuric chloride against *E. coli* was investigated. The relations between mercuric chloride, the medium and the inoculum now have been investigated. Increase in the peptone concentration of the medium causes an increase in the amount of mercuric chloride necessary for bacteriostasis while an increase in the sodium chloride content decreased it. The age of the organism is a factor likely to produce variability in the results and the use of a stored suspension of organisms is suitable for reducing this. Suspensions prepared from plate cultures are less satisfactory than those from slope cultures. The number of viable cells in inocula affects the bacteriostatic concentration of mercuric chloride, an increased concentration of bacteriostat being required with an increased number of organisms. The addition of heat-killed cells appears to make no appreciable difference to the bacteriostatic activity of mercuric chloride.

HENRY J. DEREWICZ

TABLET LUBRICANTS IN THE GRANULATING AGENT

The Incorporation of Tablet Lubricants in the Granulating Agent 1. Lubricant Suspensions and Emulsions, Appino, J. B., Banher, G. S., De Kay, H. G., Drug Standards, 27:193 (Nov.-Dec.) 1959. (Purdue University, School of Pharmacy, Lafayette, Ind.)

The authors investigate the practicality of incorporating water-insoluble tablet lubricants in certain granulating agents. The advantages of such a combination would be: (a) it would save a step in the preparation of granulations for tableting; (b) the problem of obtaining a thorough mix of small-mesh lubricants and large-mesh granules would be eliminated; (c) the problem of lubricant-granule separation in the hopper would be alleviated, and (d) the problem of producing excessive "fines" due to the tendency of granules to "break-up" or powder during mixing or tumbling with the lubricant would be eliminated. For experimental purposes, magnesium stearate and talc, sterotex, and liquid petrolatum were suspended or emulsified in the various granulating agents. The granulating agents used were: (a) starch paste 10% w/v; (b) keltose solution 3% w/v; and (c) equal parts distilled water and simple syrup, U.S.P. Aminopyrine was used as the basic tablet ingredient since it was known to be one of the more difficult chemicals to lubricate. Results indicate that suspending certain lubricants in appropriate granulating agents results in granulations which may be readily compressed on a single punch tablet machine. In addition, such combinations may actually produce tablets with a better appearance than those produced by conventional methods. The authors also offer a comprehensive and detailed summary of the effects of incorporating the lubricant into the granulating agent in regard to the physical properties of the resulting tablets.

HENRY J. DEREWICZ

ERGONOVINE MALEATE INSTABILITY

Ergonovine Maleate Instability by Accelerated Storage Tests, Moore, W. E., Drug Standards 27:187 (Nov.-Dec.) 1959. (Sterling-Winthrop Research Institute, Rensselaer, New York.)

The monographs for ergonovine maleate injection U.S.P. and B.P. differ both in preparation, label and storage requirements. In view of the above dissimilarity, the author attempts to determine which of two solutions, prepared under distinctly different conditions, would be more stable. Accelerated storage tests were made for the two distinctly different ampul solutions of ergonovine maleate at temperatures from 5° to 70°. Results indicate that official monograph solutions of ergonovine maleate, when prepared as herein described, show that a B.P. formulation is more stable above 40° and less stable below 40° than a U.S.P. formulation. In addition, the Arrhenius rate equation may yield an "apparent" failure to predict stability at low temperatures. Such a failure could be due to temperature dependent decomposition mechanisms. For ergonovine maleate injection for U.S.P., prepared as herein described, the low temperature of storage recommended (0-12°) is deemed justified.

HENRY J. DEREWICZ

SUSTAINED ACTION ORAL MEDICATION

Sustained Action Oral Medication II. The Kinetics of Release of Drugs to Fluids In Vitro, Wagner, J. C., Drug Standards 27:178 (Nov.-Dec.) 1959. (Research Laboratories, Upjohn Company, Kalamazoo, Michigan.)

The author indicates that most sustained-action dosage forms for which release-time data have been reported, release their contained drug to the fluids in the *in vitro* tests at pseudo first-order rated. For some products the first-order rate constants calculated for the period of time that the products were exposed to simulated gastric fluid are significantly different than the first-order rate constants calculated for the period of time that the products were exposed to simulated intestinal fluid. For a set of data which obeys pseudo first-order release of the drug the derivations, calculations, and an example are shown in detail. An equation is derived which allows calculation of the instantaneous rate of release at any given time during the *in vitro* test if the drug is released to the fluid at a pseudo first-order rate.

HENRY J. DEREWICZ

ANALYSIS OF PHENOBARBITAL AND ACETYLSALICYLIC ACID MIXTURES

The Analysis of Phenobarbital and Acetylsalicylic Acid Mixtures Using Ion Exchange Resins, Clair, E. G., Nair, N. C., Drug Standards 27:172 (Nov.-Dec.) 1959. (Pharmaceutical Chemistry Section, Food and Drug Directorate, Department of National Health and Welfare, Ottawa, Canada.)

A practical method for the separation and determination of pharmaceutical products containing phenobarbital and acetylsalicylic acid is offered. Separation is accomplished by means of columns of weakly basic anion exchange resins. The system is buffered at a pH within the range of optimum anion adsorption and at which phenobarbital is undissociated. Phenobarbital is not adsorbed on the resin; however, acetylsalicylic acid is quantitatively removed from solution. Following this initial separation, ammonium hydroxide solution is used to remove acetylsalicylic acid from the column. Ultraviolet spectrophotometry is used to determine the concentration of the separated components.

HENRY J. DEREWICZ

EQUATION FOR EXPRESSING RELEASE OF DRUG

An Exponential Expression for In Vitro Release of Drug From Sustained-Release Preparations, Weigand, R. G., Taylor, J. D., Drug Standards 27:165 (Nov.-Dec.) 1959. (Chemical Pharmacology Section, Abbott Laboratories, North Chicago, Ill.)

A mathematical expression describing *in vitro* release of several sustained-release preparations is given. This equation is useful in determining the fraction of the dose released immediately, the percent eventually released *in vitro*, and as a first approximation to physiological availability. The equation should also be useful as a basis for a more extended mathematical development allowing calculation of drug levels in blood and urine after ingestion of a sustained-release preparation of this type.

AUTHOR'S SUMMARY

WATER ABSORBABILITY OF PETROLATUM OINTMENT BASES

The Water Absorbability of Petrolatum Ointment Bases, Groves, G. A., de Boucier, D. J. Canadian Pharm. J. 93:37 (Jan.) 1960. (Faculty of Pharmacy, University of British Columbia, Vancouver, Canada.)

The authors present a study intended to develop a system of formulation whereby an ointment could be formulated in such a manner that it would absorb a pre-determined amount of water or solution of medicament. The investigation has centered around the non-ionic surfactants and the degree to which these agents increase the water absorbing properties of petrolatum type ointment bases. Surfactants selected were the Spans and Tweens. Water absorption by the bases was recorded in terms of "water numbers." Absorption studies were performed on petroleum-surfactant mixtures and on similar mixtures also containing Carbowax 1540. Results indicate the following:

1. Petrolatum possesses a water number of 6.0.
2. The water absorbability of every mixture was much higher than that of plain petrolatum.
3. The Spans were more effective in increasing the water absorbability of petrolatum than were the Tweens. Span 80 was most effective. The preparations, when saturated, resulted in smooth, soft, white creams of the water-in-oil emulsion type.
4. Evidence has been obtained to show that there is a maximum concentration of Span which may be used in order to form a satisfactory absorption ointment base with petrolatum. This maximum will vary depending upon the other constituents of the base in addition to the petrolatum and upon the type of base used.

In addition, the authors present graphic representations of the specific amounts of water absorbed by petrolatum-surfactant mixtures at 20°C.

HENRY J. DEREWICZ

STORAGE AND TESTING OF STERILIZED GUT

Some Aspects of the Storage and Testing of Sterilized Catgut, Wilkinson, G. R., Robins, E. L., Grimshaw, J. J., and Hudson, S. P., J. Pharm. Pharmacol. 11(Suppl.): 283T (Dec.) 1959. (Research Division, Allen & Hanburys Limited, Ware, Hertfordshire, England.)

Results obtained during an examination of plain and chromicized surgical catgut stored in tubing fluids of differing water content, and the effect on diameter, tensile strength and flexibility are described. A fall in tensile strength and an increase in diameter which vary with water content and time of storage was observed, although gut does not deteriorate rapidly when immersed in water and several days elapse before significant changes occur. The official testing methods have been examined, and the results indicate that the surgeon's knot test gives a more reliable measurement of tensile strength than the straight pull. Also the present gauge method for measurement of diameter can lead to errors due to compression of the gut. The time of equilibration of the gut in air is important for the measurement of both tensile strength and diameter, particularly when tubing fluids contain a high water content. A relation has been shown between tensile strength, extensibility and softening, and it is suggested that this might provide an index of flexibility of the gut. The effect of some common disinfectant solutions on the gut has been investigated.

AUTHOR'S SUMMARY

QUANTITATIVE DETERMINATION OF APOMORPHINE

A Rapid and Sensitive Method of Quantitative Determination of Apomorphine, Kaul, P. N., Brochmann-Hanssen, E., and Way, E. L., J. Am. Pharm. Assoc., Sci., Ed., 48:638 (Nov.) 1959. (University of California School of Pharmacy and Department of Pharmacology, School of Medicine, San Francisco, Calif.)

A study of the color reaction for apomorphine used as a test for identity in the *French Pharmacopoeia* was made. The reaction was modified to increase sensitivity and adopted to quantitative determination. The method involves oxidation of the compound by mercuric chloride and ultraviolet absorption analysis of the extracted reaction product at 330 mμ. The product obeys Beer's law over a wide range of concentration. Optimum conditions for the reaction have been determined. By simple manipulations, as little as 0.1 mcg per ml. can be determined. The method described is directly applicable to simple apomorphine preparations, such as injections or tablets, and is of particular value for analysis of microquantities of the compound in biological materials.

H. A. K. WHITNEY, JR.

SPECTROPHOTOMETRIC DETERMINATION OF CERTAIN ALKALOIDS

The Spectrophotometric Determination of Certain Alkaloids and Application to Pharmaceutical Preparations, Cross, A. H., McLaren, D., and Stevens, S. G., J. Pharm. Pharmacol. 11(Suppl.):103T (Dec.)1959. (Smith, Kline and French Laboratories Ltd., Mundells, Welwyn Garden City, Hertfordshire, England.)

A method is described for the determination of atropine, hyoscyamine, quinine, quinidine, brucine, strychnine and physostigmine by formation of the picrate of the alkaloid in an aqueous buffer at pH 7 followed by extraction of the picrate into chloroform. The picric acid is re-extracted into an alkaline buffer at pH 11 and the absorption measured at 3550A. The method has been applied to injections, tablets and other pharmaceutical preparations. The results are in agreement with those obtained by the official methods. The advantages of the method include its usefulness when dealing with small samples and the shorter assay time compared with classical methods.

AUTHOR'S SUMMARY

PHYSICO-CHEMICAL STUDIES OF ASPIRIN WITH GLYCINE

Physico-Chemical Studies of Aspirin with Glycine, Rapson, H. D., Singleton, D. O., Stuart, A. C., and Taylor, Mary P., J. Pharm. and Pharmacol. 11(Suppl.): 210T (Dec.) 1959. (Beecham Research Laboratories Limited, Brockham Park, Betchworth, Surrey, England.)

The relative solubility and rate of dissolution of aspirin in water and glycine solution have been measured. A technique involving a mathematical examination of the front profile of chromatograms has been used to study the extent of the adsorption of glycine from aqueous solution on aspirin. Aspirin is more soluble and more rapidly dissolved in glycine solution than water, and glycine is found to adsorb, in significant amounts, on aspirin crystals. The findings are discussed in an attempt to explain, in physico-chemical terms, differences in taste and adhesion to the oral mucosa that are discernible when aspirin tablets compounded with or without glycine are savoured. Attention is drawn to certain aspects of the results which have a bearing on the transport of aspirin.

AUTHOR'S SUMMARY

STABILITY ASPECTS OF SODIUM NOVOBIOCIN

Sodium Novobiocin: Stability Aspects, Busse, M. J., Lees, K. A., and Vergine, V. J., J. Pharm. Pharmacol. 11(Suppl.): 250T (Dec.) 1959. (Glaxo Laboratories Ltd., Greenford, Middlesex, England.)

The stability of monosodium novobiocin has been examined. The solid antibiotic has been shown to be sensitive to light, but if properly protected, to be stable for a period of 2 years at 20°. In aqueous solution and suspension it is affected by increase of temperature, pH and certain heavy metals. Phosphate, and possibly sul-

phate, also cause decomposition. Concentrated solutions of novobiocin become coloured, particularly above 20° and in the presence of air. Light has little effect on potency but irradiation with ultra-violet light accelerates potency loss in solution. There appears to be no difference in the potency stability of three different batches of sodium novobiocin. Ultra-violet spectrophotometry cannot be used as a method of assay.

AUTHOR'S SUMMARY

ISOLATION OF RESERPINE

Isolation of Reserpine from Rauwolfia Roots, Atal, C. K., Ind. J. Pharm. 21:339 (Dec.) 1959. (Dept. Pharmacy, Punjab University, Chandigarh.)

The author discusses the comparative value of four known methods for the extraction of reserpine from Rauwolfia roots. The methods, in general, involve the use of methanol and acetic acid as extracting mediums. Of the four methods presented, the following procedure allowed an isolation of 92.1% of the theoretical amount of reserpine present in the drug. Yields by the three remaining methods were poor.

The method consists of concentrating to dryness under reduced pressure a methanolic extract from 1 Kg. of drug. The residue is extracted with 5% aqueous acetic acid. Shaking the extract with petroleum ether removes fatty materials and is then extracted with chloroform. The benzene extract of the vacuum dried residue from the chloroform solution was chromatographed over Merck acid washed alumina. Benzene and chloroform were used as eluants. The residue from the reserpine containing eluants was crystallized from hot methanol.

HENRY J. DEREWICZ

GAS CHROMATOGRAPHY IN ROUTINE PHARMACEUTICAL ANALYSIS

Gas Chromatography in Routine Pharmaceutical Analysis, Baines, C. B. and Proctor, K. A., J. Pharm. Pharmacol. 11(Suppl.): 23OT (Dec.) 1959. (Physical Assay Division, Standards Department, Boots Pure Drug Company Limited, Nottingham, England.)

The purpose of this paper is to describe the application of the technique of gas chromatography to the determination of various volatile constituents in a wide range of pharmaceutical materials. Except for a few modifications mentioned, the equipment is of conventional design. The detector used is a thermal conductivity cell. The stationary phase in these determinations is squalane. The authors show that it is possible to determine camphor in a variety of samples at concentrations greater than one percent, and that the assay takes only about twenty minutes. In order to detect camphor at less than one percent, it is suggested that either the output of the thermal conductivity detector be amplified or that an ionization detector be used instead. The former method has the advantage of not being overly sensitive, while the latter has the advantage of not being so sensitive to fluctuations in gas flow rate. In addition to camphor, assays are conducted on menthol, diethyl phthalate, and other volatile oils. Comparisons of chemical with gas chromatographic results are tabulated for many different preparations.

H. A. K. WHITNEY, JR.

ANALYSIS OF ORGANIC IODINE

The Flask Combustion Technique in Pharmaceutical Analysis: Iodine-Containing Substances, Johnson, C. A. and Vickers, C., J. Pharm. Pharmacol., 11(Suppl.):218T (Dec.) 1959. (Analytical Development Group, Standards Department, Boots Pure Drug Co. Ltd., England.)

A rapid and simple method of analysis of organic iodine substances is described. Tables are presented showing the results obtained and a comparison of the precision obtained with the flask combustion and the official British methods on various iodine containing substances. All the assays are carried out on routine control samples and are not pretreated in any manner. The flask combustion method as proposed is applicable to a variety of dosage forms. The results indicate the authors' method is suitable for routine control purposes, and it is their opinion that this method might be acceptable as an official assay procedure. An assessment of its applicability, precision and accuracy proved the flask combustion technique to be comparable to the *British Pharmacopoeia* and the *British Pharmaceutical Codex* methods.

H. A. K. WHITNEY, JR.

PHARMACY OF CHLOROTHIAZIDE

The Pharmacy of Chlorothiazide (6-Chloro-7-sulfamyl-1,2,4-benzothiadiazine-1,1-dioxide): A New Orally Effective Diuretic Agent, Charnicki, W. F., Bacher, F.A., Freeman, S. A., and DeCesare, D. H., J. Am. Pharm. Assoc., Sci. Ed. 45:656 (Nov.) 1959. (Merck Sharp & Dohme Research Laboratories, Division of Merck & Co., Inc., West Point, Pa.)

A resumé of the pharmacological properties of chlorothiazide is presented. Such physical properties as melting point, solubility, and molecular weight are enumerated. The formulation of compressed tablets is mentioned, as well as the formulation of injectables by the freeze-drying method. The chlorothiazide in these dosage forms has been found to be quite stable in both accelerated and in long term stability studies. The result of a study of the compatibility of chlorothiazide sodium solution with various hypotensive drugs is tabulated. A satisfactory oral aqueous suspension of the free acid was formulated using tragacanth in a syrup base. The bitterness was masked by adding citrus flavors. This suspension was found quite stable at a pH of 6.5 or lower. Analytical procedures are outlined for the different dosage forms. In all cases, the assay was conducted by diluting the sample with 0.1 N sodium hydroxide, and then ultraviolet absorption at 292 mμ was determined.

H. A. K. WHITNEY, JR.

CURRENT LITERATURE

. . . also calling your attention to the following articles appearing in recent hospital and pharmaceutical journals

DETAILMEN

Superstine, E.: The Hospital Pharmacist and the Medical Service Representative *Am. Profess. Pharm.* 26:191 (Mar.) 1960.

MANUFACTURING
—Equipment

Hawney, D.: Equipment and Apparatus—7. Homogenisers and Emulsors, *Public Pharmacist* (Great Britain) 17:31 (Feb.) 1960.

NARCOTICS

Krantz, J. C., Jr.: How to Cope with Drug Addiction in Hospitals, *Modern Hosp.* 94:66 (Feb.) 1960.

PARENTERAL SOLUTIONS

Tester, William: Controlling Production of Parenteral Fluids, *Modern Hosp.* 93:102 (Dec.) 1959.

PHARMACY AND THERAPEUTICS COMMITTEE

Frazier, Walter M.: The Pharmacy and Therapeutics Committee, *Hosp. Pharm.* (Canada) 13:15 (Jan.-Feb.) 1960.

Heller, E. M.: The Doctor's Point of View of the Pharmacy and Therapeutics Committee, *Hosp. Pharm.* (Canada) 13:18 (Jan.-Feb.) 1960.

Tice, L. F.: The Generic Name Pitfall (Editorial), *Am. J. Pharm.* 132:2 (Jan.) 1960.

POISON CONTROL

Simons, Robert, Jr.: Role of the Hospital Pharmacist in Poison Control, *J. Am. Pharm. Assoc., Pract. Pharm. Ed.* 21:129 (Mar.) 1960. (Special issue devoted to Poison Prevention).

RESEARCH

Tice, L. F.: Drug Research Today (Editorial) *Am. J. Pharm.* 132:2 (Feb.) 1960.

SMALL HOSPITALS

McNabb, Douglas, M., and Wyatt, Roger E., Jr.: Hospital-Retail Pharmacy Cooperation: Close Look at Working Agreement. *Hospitals* 34:50 (Mar. 1) 1960.

GENERAL

Brown, Ray E.: Some Forces that Will Affect the Hospital and the Hospital Pharmacy, *Hosp. Management* 89:92 (Apr.) 1960.

DRUG EVALUATIONS

by the Council on Drugs of the American Medical Association

► THE FOLLOWING MONOGRAPHS and supplemental statements on drugs have been authorized by the Council on Drugs of the American Medical Association for publication and inclusion in *New and Nonofficial Drugs*. They are based upon the evaluation of available scientific data and reports of investigations.

The issue of the *Journal of the American Medical Association* from which each monograph has been taken is noted under each monograph. Monographs in this issue of the JOURNAL include those published in the *A.M.A. Journal* for January 16, February 6, and February 13, 1960.*

Notice

New and Nonofficial Drugs 1960 is now available from your local bookstore and from the publishers, J. B. Lippincott Company, Philadelphia, Pa. This 1960 edition contains monographs of drugs evaluated by the Council on Drugs of the American Medical Association and published in the Journal of the A.M.A. to October 17, 1959. The indexes listed below contain those drugs evaluated and published between October 24, 1959 and February 13, 1960.*

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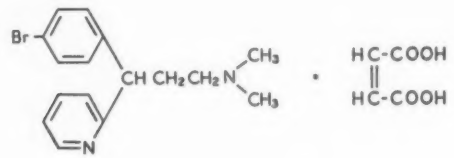
NEW AND NONOFFICIAL DRUGS

The following descriptions of drugs are based upon available evidence and do not in any case imply endorsement by the Council.

H. D. KAUTZ, M.D., *Secretary*

Dexbrompheniramine Maleate — Disomer®

DEXBROMPHENIRAMINE MALEATE (Disomer) is *d*-2-[*p*-bromo-*α*-(2-dimethylaminoethyl)benzyl] pyridine maleate.—The structural formula of dexbrompheniramine maleate may be represented as follows:



Actions and Uses

Dexbrompheniramine maleate is the dextrorotatory isomer of brompheniramine maleate, the racemic mixture. Pharmacological studies have shown that the antihistaminic activity of the racemate resides almost exclusively in the *d*-isomer. On the other hand, there is little difference in the toxicities of either the *d*-isomer or *l*-isomer and the *d,l*-mixture in experimental animals. Thus, dexbrompheniramine is about twice as potent but no more toxic than brompheniramine. Clinically, the drug appears to be a highly effective antihistamine in very low doses. Side-effects, thus far limited to drowsiness, have occurred in less than one-tenth of the cases. Dexbrompheniramine, therefore, has a high therapeutic index. (See the general statement on histamine-antagonizing agents in New and Nonofficial Drugs.)

Dosage

Dexbrompheniramine maleate is administered orally. The usual dose for adults is 2 mg. four times daily; in occasional patients, this dose may be doubled. For children, doses of 1 mg. are given four times a day. The dosage for infants is 0.5 mg. four times daily.

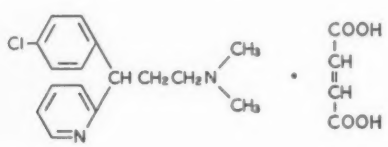
Preparations

Syrup, 0.4 mg. per cc.; tablets, 2 mg.; tablets (repeat action) 4 mg. and 6 mg.

Year of introduction: 1959.
White Laboratories, Inc., cooperated by furnishing scientific data to aid in the evaluation of dexbrompheniramine maleate.
J.Am.Med.Assoc. **172:242 (Jan. 16) 1960.**

Dexchlorpheniramine Maleate — Polaramine® Maleate

DEXCHLORPHENIRAMINE MALEATE (Polaramine Maleate) is *d*-2-[*p*-chloro-*α*-(2-dimethylaminoethyl) benzyl] pyridine maleate.—The structural formula of dexchlorpheniramine maleate may be represented as follows:



Actions and Uses

Dexchlorpheniramine maleate is the dextrorotatory isomer of racemic chlorpheniramine maleate. Pharmacological studies with the dextro and levo isomers as well as the racemic mixture show that antihistaminic activity resides primarily in the dextrorotatory component. Thus, the *d*-isomer is about twice as potent as the racemate; the *l*-isomer has only about 1/100 the antihistaminic activity of the racemate. Since the toxicities of all three components are about the same, the fact that the same histamine-antagonizing effects may be achieved with doses of dexchlorpheniramine that are only half those required for chlorpheniramine would indicate a greater margin of safety for the *d*-isomer. Clinical observations have confirmed the high degree of effectiveness and low incidence of side-effects with dexchlorpheniramine. (See the general statement on histamine-antagonizing agents in New and Nonofficial Drugs.)

Dosage

Dexchlorpheniramine is administered orally. For adults, the usual dose is 2 mg. three or four times daily. Alternatively, a single repeat action tablet containing a total of 4 or 6 mg. may be taken in the morning and again before retiring. These doses are reduced to one-half for children under 12 years of age and to one-fourth for infants.

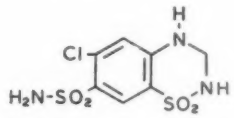
Preparations

Syrup 0.4 mg. per cc.; tablets 2 mg.; tablets (repeat action) 4 mg. and 6 mg.

Year of introduction: 1958.
Schering Corporation cooperated by furnishing scientific data to aid in the evaluation of dexchlorpheniramine maleate.
J.Am.Med.Assoc. **172:242 (Jan. 16) 1960**

Hydrochlorothiazide — Esidrix® HydroDiuril® Oretic®

HYDROCHLOROTHIAZIDE (Esidrix, HydroDiuril, Oretic) is 6-chloro-7-sulfamyl - 2H-3,4-dihydro - 1,2,4-benzothiadiazine-1,1-dioxide.—The structural formula of hydrochlorothiazide may be represented as follows:



Actions and Uses

Hydrochlorothiazide is a potent, orally effective diuretic agent, closely related to chlorothiazide, but effective in doses only one-tenth as great as those required for the latter drug. (See the monograph on chlorothiazide in J. A. M. A. *169*:1191-1192 [March 14] 1959.)

Hydrochlorothiazide increases the urinary excretion of sodium and chloride and, to a lesser extent that of potassium; fluid excretion is increased proportionately. Experimentally, hydrochlorothiazide has been shown to antagonize the sodium-retaining effect of aldosterone and desoxycorticosterone and the antidiuretic effect of vasopressin. In comparison with chlorothiazide, there is suggestive, but not conclusive, evidence that the maximal diuresis obtainable with hydrochlorothiazide may be slightly greater, that the ratio of soduim to potassium excretion may be somewhat higher, and that its diuretic effect may persist a little longer than that of the former drug.

Hydrochlorothiazide apparently produces its effects by inhibiting reabsorption of electrolytes by the renal tubules; it does not alter the renal blood flow or the glomerular filtration

rate. In vitro, hydrochlorothiazide is considerably less active than chlorothiazide in inhibiting carbonic anhydrase; this action probably contributes only slightly, if at all, to the diuretic effect of usual doses in vivo. Hydrochlorothiazide ordinarily produces no appreciable change in serum electrolyte concentrations or in acid-base balance. Nevertheless, hypokalemia, hypochloremic alkalosis, and other electrolyte disturbances may be provoked by excessive doses or careless use of the drug.

Hydrochlorothiazide is well absorbed after oral administration. Its diuretic effect occurs promptly and becomes maximal within a few hours; some residual effect may persist for a total of 12 hours or more. The drug is eliminated largely by the kidney. Since its clearance greatly exceeds the glomerular filtration rate, it is assumed to be actively secreted by the renal tubules. There is no present evidence that metabolic degradation and storage play a significant part in the ultimate disposition of hydrochlorothiazide.

Hydrochlorothiazide does not differ significantly from chlorothiazide in its range of clinical application and, like the latter, is chiefly useful for the relief of edema and the adjunctive management of hypertension. It effectively induces diuresis and fluid loss in the presence of the edema of congestive heart failure, nephrosis, some forms of nephritis, toxemia of pregnancy, hepatic cirrhosis, and the fluid retention associated with premenstrual tension or therapy with corticotropin, corticosteroids, and some estrogens. There is no known contraindication to using it in conjunction with parenterally administered mercurials, with which its effects are additive.

In the management of hypertension, hydrochlorothiazide alone may occasionally produce a satisfactory reduction in blood pressure. It is most effective, however, when used concomitantly with reduced doses of other antihypertensive drugs, including ganglionic blocking agents, Rauwolfia alkaloids, Veratrum derivatives, and hydralazine.

Hydrochlorothiazide may be effective in patients who have become refractory to other diuretics, including chlorothiazide. Also, some patients in whom chlorothiazide produces prohibitive side-effects may tolerate hydrochlorothiazide.

Patients receiving hydrochlorothiazide should be carefully watched for signs of electrolyte depletion, such as weakness, lethargy, thirst, xerostomia, nausea, vomiting, muscle cramps, oliguria, and hypotension. Serum electrolyte determinations should be done periodically if the drug is given over a considerable period of time. Failure to correct early electrolyte disturbances may lead to convulsions, coma, and death.

Hydrochlorothiazide, like chlorothiazide, should be used with great caution in the presence of hepatic cirrhosis, marked renal impairment, and in patients receiving digitalis. The complications which may attend the use of hydrochlorothiazide in these conditions and the measures which should be employed to prevent or combat them are similar to those for chlorothiazide.

Other side-effects which have been observed with the use of hydrochlorothiazide include thrombocytopenic purpura, photosensitivity, skin eruption, and gastrointestinal disturbances.

Dosage

Hydrochlorothiazide is administered orally. The dosage must be adjusted in accordance with the requirements and tolerance of the individual patient. The total daily dosage should not exceed 200 mg., as this appears to be the maximal therapeutic dosage, above which little or no additional activity seems to occur.

The doses usually required for initiating diuresis in the presence of edema range from 25 to 200 mg. per day. Smaller maintenance doses may be adequate to prevent recurrence of edema once excess fluid has been eliminated. In the adjunctive management of hypertension, 25 to 100 mg. per day is given, usually in conjunction with reduced doses of other hypotensive agents. The use of hydrochlorothiazide often makes possible some liberalization of the salt intake in both hypertension and conditions involving edema. For the relief of premenstrual tension, 25 to 50 mg. given once or twice daily may be tried.

Administration of the drug early in the day will render the complication of nocturia less troublesome. Daily administration of 240 cc. (8 oz.) of tomato or citrus fruit juice will help to prevent potassium depletion and is indicated in patients in whom hypokalemia is particularly likely to occur or in whom it is especially to be feared. Potassium chloride, in doses of 2 to 6 Gm. daily, may be substituted for the fruit juice if desired.

Preparations

Tablets 25 mg. and 50 mg.

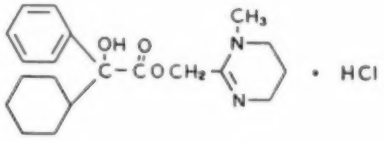
Year of introduction: 1959.

Ciba Pharmaceutical Products, Inc., and Merck Sharp & Dohme Research Laboratories, Division of Merck & Co., Inc., cooperated by furnishing scientific data to aid in the evaluation of hydrochlorothiazide.

J.Am.Med.Assoc. **172:241 (Jan. 16) 1960.**

Oxyphencyclimine Hydrochloride — Daricon®

OXYPHENCYCLIMINE HYDROCHLORIDE (Daricon) is (1-methyl-1,4,5,6-tetrahydro-2-pyrimidyl)methyl α-cyclohexyl-α-phenylglycolate hydrochloride.—The structural formula of oxyphencyclimine hydrochloride may be represented as follows:



Actions and Uses

Oxyphencyclimine hydrochloride, an anticholinergic agent, is used clinically as an adjunct in the management of peptic ulcer.

Oxyphencyclimine hydrochloride is basically atropine-like in action. Thus, in animals, it produces mydriasis, inhibits salivation, lacrimation, and pancreatic secretion, and decreases the tone and amplitude of intestinal contractions. It diminishes both total and free gastric hydrochloric acid secretion, whether spontaneous or provoked by histamine or a test metal, and inhibits the development of experimental ulcers. The action of oxyphencyclimine is largely peripheral; usual doses neither block transmission in ganglions nor exert a curare-like action on the myoneural junction of skeletal muscle. It does, however, antagonize tremors produced by 1,1'-(2-butynylene)dipyrrolidine(tremorine), presumably by an action within the central nervous system.

As an adjunct to diet, rest, and antacids, oxyphencyclimine hydrochloride may afford symptomatic relief from the pain of peptic ulcer, with an accompanying suppression of gastric motility and a decrease in the volume and acidity of gastric secretion. When compared to other atropine-like drugs, it appears to have a relatively long duration of action; after oral administration, effects appear within 1 to 2 hours, become maximal in 6 to 8 hours, and persist for as long as 12 hours.

Side-effects reported are, for the most part, similar to those of other anticholinergic drugs; dryness of the mouth, blurred vision, constipation, urinary hesitancy or retention, and, less frequently, drowsiness, palpitation, and increased ocular tension. These symptoms are often satisfactorily controlled by reducing the dose.

Like other atropine-like drugs, oxyphencyclimine hydrochloride is contraindicated in patients with glaucoma and should be used with caution in the presence of prostatic hypertrophy, cardiospasm, or pyloric obstruction.

Dosage

Oxyphencyclimine hydrochloride is administered orally. The usual dose is 10 mg. given twice daily. If the response is inadequate, the total daily dosage may be gradually increased up to 50 mg. (given in divided amounts) unless prohibitive side-effects supervene. The dosage should be adjusted for each patient to achieve maximal benefit without undue toxicity.

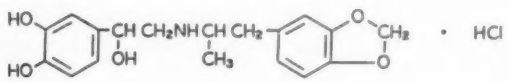
Preparations

Tablets 10 mg.

Year of introduction: 1958.
Pfizer Laboratories, Division of Chas. Pfizer & Co., Inc., cooperated by furnishing scientific data to aid in the evaluation of oxyphencyclimine hydrochloride.
J. Am. Med. Assoc. 172:564 (Feb. 6) 1960.

Protokylol Hydrochloride — Caytine®

PROTOKYLOL HYDROCHLORIDE (Caytine) is α[(α-methyl-3,4-methylenedioxyphenethylamino)methyl]protocatechuyl alcohol hydrochloride.—The structural formula of protokylol hydrochloride may be represented as follows:



Actions and Uses

Protokylol hydrochloride, a sympathomimetic amine, resembles isoproterenol hydrochloride in its pattern of pharmacological activity. Used principally as a bronchodilator, it may afford symptomatic relief of dyspnea and objective signs of improved respiratory function in such respiratory illnesses as bronchial asthma, chronic pulmonary emphysema, pulmonary fibrosis, chronic bronchitis, and bronchiectasis. In patients responding favorably, the drug produces a temporary increase in vital capacity, maximal breathing capacity, and expiratory velocity and a decrease in bronchial resistance. Although there is no evidence that it has any direct effect on the volume or character of respiratory secretion, its bronchodilating effect may facilitate expectoration of excessive secretion. When administered orally in the long-term management of chronic bronchial asthma, it seems to be about as effective as ephedrine. For the management of acute dyspneic episodes, it may be given by nebulization or injection and, when so used, produces results comparable to those of isoproterenol or epinephrine. Some patients who have become refractory to other bronchodilators remain responsive to protokylol hydrochloride; other patients, because of individual variation in response, may find it more helpful than other drugs.

Protokylol hydrochloride apparently is well absorbed after oral administration; effects are discernible within 30 to 90 minutes and persist for three to four hours. After inhalation of nebulized solutions or after intramuscular injection, effects appear within 5 to 10 minutes.

Side-Effects

Like other adrenergic bronchodilators, in effective doses, protokylol hydrochloride not infrequently produces disagreeable side-effects, reflecting its action on the cardiovascular and central nervous systems. After usual oral doses, tachycardia occurs infrequently, whereas the blood pressure is not altered. On the other hand, larger oral doses or parenterally administered doses are quite often followed by tachycardia and palpitation; even in patients with quite severe tachycardia, however, the blood pressure ordinarily shows little change. Electrocardiographic studies have revealed no changes other than sinus tachycardia.

Other reported side-effects include tremulousness, tenseness, insomnia, dizziness, weakness, and nausea.

Experimental Pharmacology

Protokylol hydrochloride is a potent inhibitor of smooth muscle, a powerful vasodepressor agent, and a cardiac stimulant. Intravenous injections in animals produce a sharp but fleeting fall in blood pressure, a decrease in total peripheral resistance, augmentation of the cardiac rate and output, increase in the respiratory rate, and a suppression of intestinal motility. Its bronchodilating activity is evident both in the intact animals and in isolated preparations; it is effective in relaxing bronchospasm induced either by histamine or by cholinergic agents and, in this respect, is approximately equal in potency to isoproterenol.

Dosage

Protokylol hydrochloride is administered orally, by intramuscular or subcutaneous injection, or by inhalation.

For the long-term management of bronchial asthma and other chronic respiratory illnesses, 2 to 4 mg. is given orally four times daily, usually with or after meals (in order to minimize side-effects) and at bedtime. A barbiturate or other sedative may be given concomitantly, if necessary, to control apprehension, nervousness, and other symptoms of central nervous system stimulation.

In the management of subacute or acute exacerbations of bronchial asthma, 0.1 to 0.5 mg. of protokylol hydrochloride may be given by intramuscular or subcutaneous injection. This can be supplemented, if necessary, by inhalations of nebulized solutions four to six times daily. Dosage is adjusted, within the stated dosage range, in accordance with the severity of symptoms and the response of the patient.

Because of its potential ability to cause marked cardiac acceleration, protokylol hydrochloride is probably contraindicated in the presence of serious cardiac arrhythmias or insufficiency of the coronary circulation.

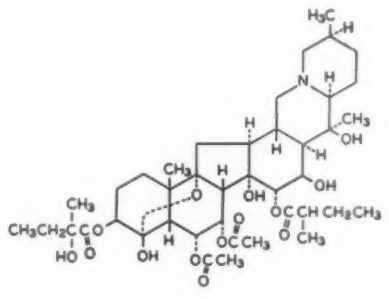
Preparations

Solution (inhalant) 1:100; solution (injection) 0.5 mg. in 1 cc.; tablets 2 mg.

Year of introduction: 1959.
Lakeside Laboratories, Inc., cooperated by furnishing scientific data to aid in the evaluation of protokylol hydrochloride.
J.Am.Med.Assoc. 172:242 (Jan. 16) 1960.

Protoveratrine A — Protalba®

PROTOVERATRINE A (Protalba) is protoverine 3-(*d*)-2-hydroxy-2-methylbutyrate 6,7-diacetate 15-(*l*)-2-methylbutyrate.—The structural formula of protoveratrine A may be represented as follows:



Actions and Uses

Protoveratrine A, which has actions, uses, and side-effects that resemble those of the preparation protoveratrines A and B, is employed clinically in the management of hypertension. Protoveratrine A differs chemically from protoveratrine B only by one additional oxygen atom; the pharmacological effects of the two alkaloids are qualitatively similar. Quantitatively, protoveratrine A is the more potent. Although the exact relative oral potency of the two drugs in man remains to be established, the available evidence suggests that protoveratrine A may be up to 10 times as active as protoveratrine B. On the other hand, on intravenous injection in dogs, the two alkaloids have approximately the same hypotensive activity, protoveratrine A being only slightly the more potent.

Protoveratrine A is employed for the adjunctive management of hypertension in the same manner as the preparation protoveratrines A and B. Although it is effective in lower doses than the latter preparation, the margin between the effective antihypertensive dose and the emetic dose is no greater. Consequently, protoveratrine A shares the major disadvantage of other Veratrum preparations; doses only slightly greater than those required for therapeutic action produce vomiting and other unpleasant effects. Dosage, therefore, must be regulated with the greatest precision. Protoveratrine A has the advantage that it is a single alkaloid and not a complex product containing two or more alkaloids whose proportions may vary in different preparations. However, the superiority of the single alkaloid over other well-standardized Veratrum preparations is largely theoretical and has not yet been demonstrated in the clinic.

Dosage

Protoveratrine A is administered orally, usually after meals and at bedtime. The principles of dosage are the same as for the oral administration of protoveratrines A and B. Because the margin between the effective and toxic doses is, in many patients, quite small, successful use of the drug depends on individualization of the dose. Hospitalization of the patient facilitates determination of the optimal dosage schedule. If possible, the blood pressure should be determined two to three hours after each dose as a guide to appropriate dosage adjustments. The patient should be instructed to report the earliest symptoms of toxicity, usually a feeling of warmth, flushing, nausea, or increased salivation.

The initial orally given dose is 0.2 mg. In hospitalized patients, each subsequent dose is then increased by successive increments of 0.05 or 0.1 mg. until optimal hypotensive response is obtained or until side-effects become severe. This amount can then be given four times daily. If side-effects appear before the desired therapeutic effect is achieved, dosage should be reduced by 0.05 or 0.1 mg. and then again increased as the patient's tolerance permits.

In the ambulatory patient, dosage is increased more gradually. The initial dosage of 0.2 mg. four times daily is continued for one or two days. Then, if significant reduction in blood pressure has not occurred, the total daily dosage is increased by 0.2 to 0.4 mg. Similar increases may be made at intervals of 24 to 48 hours, until the desired effect has been achieved or until side-effects appear.

Preparations

Tablets 0.2 mg.

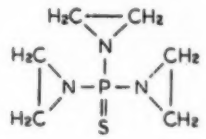
Year of introduction: 1958.

Pitman-Moore Company, Division of Allied Laboratories, Inc., cooperated by furnishing scientific data to aid in the evaluation of protoveratrine A.

J.Am.Med.Assoc. 172:240 (Jan. 16) 1960.

Thio-Tepa

THIO-TEPA (Thio-Tepa) is *tris*(1-aziridinyl)phosphine sulfide.—N,N'N"-Triethylenethiophosphoramide. — The structural formula of thio-tepa may be represented as follows:



Actions and Uses

Thio-tepa, a polyfunctioning alkylating agent, is used for the palliative management of certain malignant diseases. There are no qualitative differences in its action on normal and tumor cells from those observed with nitrogen mustard (HN_2), triethylene melamine (TEM), and chlorambucil. Since, however, it is not a vesicant and can be placed in solution at a pH which is not irritating to the tissues, thio-tepa can be given by all parenteral routes. The drug has a slower onset of action than the other alkylating agents, but immediate side-effects, such as nausea and vomiting, are minimal.

Thio-tepa has been tried in the palliation of a large variety of neoplastic diseases. Results have been variable, and there is a wide divergence of opinion as to the relative effectiveness and proper area of usefulness of this drug in comparison with other alkylating agents. Apparently, the choice of chemotherapeutic agents and the sequence in which they are used depend, in large measure, on prior experience and personal preference. In general, however, thio-tepa may be considered a nitrogen mustard-like drug with clinical applications similar to this class of drugs. There seems to be fairly consistent, but not unanimous, agreement by experts that thio-tepa is not the initial treatment of choice in any malignant neoplasm. Rather, it probably should be withheld until further surgical and radiation (x-ray or isotope) therapy is no longer effective or feasible; it is ordinarily not used for early or localized lesions. Owing to the lag between administration of thio-tepa and tumor response, the drug is of limited value for the acute complications or phases of far advanced neoplastic diseases. In favorable cases, the duration of remission is variable, and, in common with other anti-neoplastic agents, subsequent courses of therapy with thio-tepa are usually less effective than the previous ones.

Clinical experience with thio-tepa has been greater in epithelial (carcinomatous) tumors than in any other type of malignant disease. Present evidence indicates that the drug has a definite place in the therapy of metastatic carcinoma of the ovary and breast. Because it can be given by intraserosal injection, thio-tepa is helpful in the control of persistent serious effusions associated with such lesions. Results seem to be better in patients with pleural and pericardial effusion than in those with peritoneal effusion (ascites). It is difficult to know whether chemotherapy in such cases actually prolongs life. However, satisfactory remissions, with objective and symptomatic improvement, have been observed in many instances. Thus, the judicious use of thio-tepa may make existence more comfortable in patients with wide-spread ovarian and mammary carcinoma when radiation and hormonal therapy no longer afford palliation.

The drug has been tried in a number of patients with disseminated bronchogenic carcinoma, and, in occasional instances, it has provided brief periods of remission. Given either by carotid artery injection or intracerebrally (directly into the brain at the time of surgery or through a bur hole), thio-tepa has been used with some beneficial effect in a small number of patients with cerebral metastases. There are sporadic reports of transient remissions after the use of thio-tepa in patients with other carcinomas. In many cases, the drug has been injected directly into the tumor

mass as, for example, into breast lesions and by perianal infiltration into obstructive lesions of the anus and rectum. Thio-tepa has shown little promise for the palliation of carcinomas of the gastrointestinal tract, head and neck, prostate, kidney, liver, biliary tract, or pancreas.

Both chronic granulocytic and lymphocytic leukemia may respond to thio-tepa, the results being better in the former than in the latter. Most workers in the field seem to feel that radiation therapy is preferable for the initial treatment of chronic leukemia. The role of thio-tepa in radiation-resistant cases is less well defined. Thus, in chronic granulocytic leukemia, some hematologists advocate busulfan as the first choice of available chemotherapeutic agents; others prefer thio-tepa. Likewise, in patients with chronic lymphocytic leukemia, the drug can be used in the same manner as mechlorethamine, triethylene melamine, or chlorambucil, but there is no general agreement as to which agent is preferable or should be used first. Thio-tepa is of no value and should not be used in acute leukemias. Results of therapy in malignant lymphoma (principally lymphosarcoma and Hodgkin's disease), while limited, indicate that thio-tepa is probably of the same order of effectiveness as nitrogen mustard and related alkylating agents. The drug has been tried in melanosarcoma (malignant melanoma), but, despite a few favorable reports, it has been generally disappointing for this purpose.

Recently, some investigators have proposed the administration of thio-tepa and other alkylating agents at the time of cancer surgery and in the immediate postoperative period, in an attempt to augment surgical palliation and to diminish seeding due to surgery. In the laboratory, such use of the drug has been observed to decrease the number of "takes" of implanted tumors in experimental animals. Clinical experience, however, is far too limited to permit the routine recommendation of alkylating agents for this purpose, either at the time of palliative or curative surgery. Only further study will establish whether such agents are beneficial from the standpoint of over-all cancer mortality and incidence of postsurgical neoplastic recurrence. Hence, this procedure, which carries with it an appreciable added risk to the patient, must be considered experimental.

Toxicity and Side-Effects

Thio-tepa is a drug of high toxicity for the hematopoietic system. The drug affects all of the formed elements of the peripheral blood. Thus, lymphopenia followed by neutropenia and thrombocytopenia may attend its use; erythrocyte depression is variable. The effects on bone marrow are unpredictable; rarely, maximum depression occurs as late as 30 days after therapy has been discontinued. In some cases, irreversible hypoplastic anemia has occurred. The necessity for continuous maintenance therapy involves the hazard of potentially serious adverse effects on bone marrow. It is imperative that the hematological status of the patient be carefully observed during, and for some time after, therapy. The hemoglobin level and leukocyte and platelet counts should be determined daily during the first week or 10 days of treatment, once a week while the patient is receiving maintenance therapy, and for four weeks after discontinuance of medication. Any significant changes in these elements of the blood necessitate prompt assessment of the erythrocyte level and a differential leukocyte count. When the leukocyte and/or platelet counts have fallen to 4,000 or 150,000 respectively, either therapy should be discontinued or the dosage greatly reduced. Thio-tepa should be given cautiously, if at all, to patients whose bone marrow has been depressed by direct invasion of tumor cells or by previous therapy with ionizing radiation or other cytotoxic drugs. It is contraindicated in pregnant women because of serious adverse effects on the fetus.

Nausea, vomiting, anorexia, and headache are the principal side-effects of thio-tepa. Since gastrointestinal symptoms are less frequent and less severe than with other nitrogen mustard-like drugs, one should never atttempt to gauge therapy by the dose required to produce emesis, as has been suggested for other agents of this type. Febrile and allergic reactions are occasionally encountered with administration of thio-tepa. Intestinal perforation through cytolysis within a lesion might occur. The drug has also been observed to produce amenorrhea in the female and diminished spermatogenesis in the male.

Caution is again enjoined in the use of thio-tepa. Because of its cumulative and unpredictable toxic effects on bone marrow, the drug is best reserved for use by physicians experienced in the chemotherapeutic management of malignant disease.

Dosage

Thio-tepa can be administered by the following routes: intravenous, intra-arterial, intramuscular, intratumor (direct, transrectal, transvaginal, intracerebral) and intraserosal (pleural, pericardial, peritoneal), or by combinations of these. Dosage can never be given empirically—it must be completely individualized or titrated for each patient according to the hematological and clinical response. It should be emphasized that thio-tepa has a slow onset of action and a cumulative toxic effect on the bone marrow. Thus, a delayed response to the drug may be deceptive and occasion an unwarranted frequency of administration, with subsequent signs of toxicity. Maintenance therapy should be no more frequent than once every one to three weeks in order to allow for better evaluation of the hematological picture.

Although there is no "usual" dose for intravenous, intra-arterial, or intramuscular injection, most authorities agree that the maximum daily dose for the initiation of therapy by these routes is 0.2 mg. per kilogram of body weight. Such dosage should be continued no longer than five days, even though no changes in the peripheral blood have become apparent. Depending on subsequent clinical and hematological response, therapy may then be cautiously resumed. The maximum maintenance dose is 0.2 mg. per kilogram of body weight per week. For intracarotid use in patients with cerebral lesions, doses as high as 40 to 50 mg. have been given and repeated at intervals of six to nine weeks.

For local tumor injection, amounts ranging from 10 to 60 mg. have been given in single or multiple sites.

For intraserosal use in patients with serious effusions secondary to metastatic lesions, doses of 10 to 50 mg. have been injected into the pleural, pericardial, and peritoneal cavities after paracentesis. The dose can be repeated when fluid reaccumulates.

For the treatment of leukemia, dosage is governed not only by the clinical and hematological response but also by the severity of the disease prior to initiation of therapy. In general, the higher the leukocyte count the greater the amount of drug required. This is only a general rule, however, and each case must be considered individually, keeping in mind the unpredictable response of diseased bone marrow to drugs of this type. Particular caution is enjoined in patients with chronic lymphocytic leukemia since this type of the disease is generally more sensitive to cytotoxic agents than is chronic granulocytic leukemia. For the initiation of therapy, doses ranging from 10 to 60 mg. or more are given (usually by intravenous injection) over a period of five days. Maintenance therapy is carried out on a weekly to triweekly schedule in doses no larger than 10 mg.

Powdered, sterile preparations of thio-tepa should be stored in the refrigerator and, after reconstitution with sterile water for injection, used immediately. Unused solutions should be discarded.

Preparations

Powder (injection) 15 mg.

Year of introduction: 1959.

Lederle Laboratories Division, American Cyanamid Company, cooperated by furnishing scientific data to aid in the evaluation of thio-tepa.

J. Am. Med. Assoc. 172:565 (Feb. 6) 1960.

The Council has authorized publication of the following report. H. D. KAUTZ, M.D., *Secretary*

CURRENT STATUS OF THE THERAPY OF BRUCELLOSIS IN HUMAN BEINGS

WESLEY W. SPINK, M.D., MINNEAPOLIS

► THE SUCCESSFUL MANAGEMENT of brucellosis in human beings depends on a recognition of certain basic features of the disease. Brucellosis is caused by one of three species of brucellae, namely Brucella abortus, Brucella melitensis, and Brucella suis. This distinction is important because the natural course of the disease differs in severity according to the species of brucellae that has invaded the tissues. Illness caused by Br. abortus is less severe than that caused by the other two species. This form of brucellosis is most prevalent in the United States. Disease resulting from Br. melitensis is more serious and is characterized by prostration, complications, and chronicity. Br. melitensis is the cause of most brucellosis in human beings, world-wide. The outstanding feature of brucellosis due to Br. suis is a debilitating and prolonged febrile illness, with complicating suppurating lesions of the bone and viscera. Brucellosis caused by Br. suis is prevalent in certain areas in the United States where large numbers of swine are raised.

Another basic factor in the management of brucellosis is the necessity for establishing a precise diagnosis of active disease before starting therapy. This requires careful bacteriological and serologic studies. When infection cannot be established bacteriologically by culture, the results of brucella sero-agglutination tests must be cautiously interpreted. In general, agglutination titers of 1:100 or over are consistent with active disease. Lower titers are often of doubtful significance, especially when these low titers are found with repeated tests. When bacteriological cultures remain sterile and brucella agglutinins are absent or present only in a low titer, a positive intradermal brucella test is of doubtful diagnostic value. The brucella skin test is specific and indicates past exposure to the disease but a positive test does not connote active brucellosis.

One added feature of brucellosis requires elucidation. Brucellosis may have a severe impact on the nervous system. Weakness and mental depression are common manifestations. An emotionally unstable person may be plunged into a severe depression after an acute brucella infection. He may be mistakenly subjected to "antibrucella therapy" for several years instead of having efforts directed toward correcting the underlying psychosomatic disturbance. On the other hand, it is also a grave error to subject a patient with undetected active brucellosis to psychotherapy. The correlation of neurological and psychic disturbances with brucellosis should be kept in mind.

After the diagnosis of active brucellosis has been established, the patient should be informed that brucellosis is a self-limited disease. The patient is not encouraged when he is told that brucellosis can result in a chronic debilitating illness; however, brucellosis causes disabling chronic illness in relatively few patients. The emotional pattern of the patient must be carefully surveyed, since his ultimate restoration to good health will often depend on this factor. For the most part, brucellosis is an occupational disease, and the interpretation of chronic illness can be the result of disability insurance.

From the Department of Medicine, University of Minnesota Medical School.

Specific Measures

The patient with active brucellosis should engage in a minimum of physical activity. The toxic and febrile patient should be kept in bed. Somatic pains and headaches can be alleviated with salicylates, although the nocturnal sweats associated with brucellosis can be accentuated by therapy with salicylates. Insomnia and nervousness during the acute illness can be relieved with sedatives.

It has been established in experimental brucellosis and in man that antibiotics will suppress the infection, reduce complications, and shorten the course of the disease. The tetracycline drugs, chlortetracycline (Aureomycin) hydrochloride, oxytetracycline (Terramycin) hydrochloride, or tetracycline (Achromycin, Panmycin, Polycycline, Steclin, Tetracyn) hydrochloride, constitute the treatment of choice and are recommended in an oral dose of 500 mg. every six hours for a minimum of 21 days. If the patients tolerate the drug well, this same therapeutic regimen can be repeated within six to eight weeks, if a relapse should occur. It is not unusual for patients to have a relapse of their illness two to three weeks after the completion of an initial course of tetracycline therapy, especially with disease caused by Br. melitensis. In the more severe cases, 1 to 2 Gm. of streptomycin daily for 14 days should be simultaneously administered intramuscularly. In some instances, the disease may relapse two and three times before recovery takes place. One of the tetracyclines should be used for 21 days for each relapse. It is very doubtful if more than three courses of antibiotic therapy are beneficial, except in the rare patient in whom demonstrable suppuration is present.

Patients exhibiting a severe toxic state may have an accentuation of their illness shortly after an intial dose of antibiotic. This systemic reaction can be so severe that peripheral vascular collapse occurs. This unfavorable reaction is presumed to be due to the antibrucella action of the drug liberating brucella antigen (endotoxin) in a patient with acquired brucella hypersensitivity. This reaction can be prevented by administering corticotropin (Acth, Acthar, Corticotropin) or one of the glucocorticoids with the antibiotic. A suspension of corticotropin can be given intramuscularly in a dose of 40 mg. every eight hours. Cortisone (Cortisone, Cortogen, Cortone) acetate is given orally in a dose of 100 to 300 mg. three times daily or prednisone (Deltasone, Deltra, Meticorten, Paracort) in an oral dose of 20 mg. three times daily. Steroid therapy also is beneficial in the seriously ill patient. The initial Herxheimer-like reactions can also be avoided by use of small initial doses of antibiotics. The toxemia and febrile state gradually subside over a period of several days when antibiotics alone are used, but, when steroid drugs are also employed, the patient improves within 24 hours. Treatment with steroids should not be continued for more than 72 hours and should be restricted to the more seriously ill patients.

Although brucella vaccines are used for brucellosis in human beings, there is no general agreement concerning their value. Vaccine has usually been employed in the treatment of chronic brucellosis. The attempt is made to desensitize patients to brucella antigen by intermittent parenteral injections of the material over a long period of time.

Unfortunately, the results are difficult to evaluate, and the vaccines cause considerable discomfort and expense to the patient. Vaccine has also been recommended for the more acutely ill patients, along with antibiotics. The vaccine is given intravenously in a dose that will provoke a systemic febrile reaction. This procedure is dangerous since peripheral vascular failure can occur. Until more definitive evidence is at hand, vaccine therapy cannot be recommended for either "desensitizing" purposes or for the purpose of inducing a pyrogenic response.

Chronic Brucellosis

One of the problems that perplexes clinicians is the management of patients with so-called chronic brucellosis. These persons express subjective complaints consistent with chronic illness, but objective evidence of disease is often not apparent. Lacking either bacteriological or significant serologic proof of activity, these patients are not infrequently subjected to long courses of vaccine therapy. They usually have a positive dermal reaction for brucella antigen. In addition to vaccine, they may also receive one or more courses of antibiotic therapy. The precise diagnosis is usually in doubt, and the results of therapy may be dubious.

Comment

At present, neither vaccine nor antibiotic therapy can be recommended for acute or chronic illness unless the diagnosis of brucellosis can be supported by dependable bacteriological or serologic data. Subjective complaints, with or without a positive brucella skin test, do not constitute sufficient evidence for a diagnosis of active brucellosis.

J. Am. Med. Assoc. 172:697 (Feb. 13) 1960.

REPORT TO THE COUNCIL

The Council has authorized publication of the following report. H. D. KAUTZ, M.D., *Secretary*

CURRENT STATUS OF THERAPY IN CEREBRAL VASCULAR ACCIDENTS

GEORGE A. WOLF JR., M.D., BURLINGTON, VT.

► CEREBRAL VASCULAR ACCIDENTS may be defined as sudden events occurring in the cerebrum caused by diseases of the blood vessels. Simple description of the various types of accidents and discussion of differential diagnosis are beyond the scope of this paper.

Structural and Functional Considerations

Several anatomic and physiological facts are important to consider in discussing treatment of the more common types of cerebral vascular accidents. Effective collateral circulation is possible in the brain. Vasospasm, with resultant structural defects, has been observed. Sludging of blood as a transient phenomenon has been observed in superficial arteries. The humoral and nervous control of circulation in the brain is highly developed. Disease of the blood vessels in the brain is manifest clinically by the secondary effects on functioning nervous tissue. Moreover, at autopsy, the secondary effects overshadow or obscure the primary blood vessel lesion.

These features complicate the evaluation of the effects of therapy, especially if the therapy is directed at the relief of transient episodes. For example, in thrombotic disease, is a good result of treatment caused by (1) abolition of spasm, (2) establishment of collateral circulation, (3) prevention of extension of a thrombus, (4) relief of sludging, (5) other factors, or (6) a combination of factors?

Our basic knowledge of the pathophysiology of cerebral disease is lacking. Thus, attempts to alter the disease processes are purely empirical, and the interpretation of results is inaccurate.

Clinical Considerations

Possibly, the most common cerebral vascular accidents are (1) transient cerebral ischemia, (2) cerebral arterial thrombosis, (3) cerebral arterial embolism, (4) cerebral hemorrhage associated with hypertension, and (5) cerebral artery aneurysm of the berry type associated with rupture. The differential diagnosis of these conditions is admittedly difficult. Cerebral hemorrhage associated with hypertension is usually fatal. Cerebral artery aneurysm requires arteriography and possibly surgery.

Dean and Professor of Clinical Medicine, College of Medicine, University of Vermont.

During the past few years, attention has been focused on the occurrence of arteriosclerotic plaques and thrombi, either in the common carotid artery or the proximal part of the internal carotid artery, as the cause of impaired circulation to the brain. In those instances in which symptoms of hemiparesis come on slowly, consideration should be given to this diagnosis. Here again, arteriography followed by surgery, in appropriate instances, is indicated. The medical treatment of transient cerebral ischemia and cerebral arterial thrombosis and embolism is to be considered here. Once damage to the cerebral nervous tissue is established, as evidenced by persistent neurological defects, nothing yet known can change the lesion in the brain. Treatment is supportive during the acute phase of a cerebral vascular accident and rehabilitative when the defects stabilize. Attention to coexisting disease, the complications of immobility, and the stress of acute illness are important in all patients. Techniques are available for strengthening weakened muscles and returning many seriously handicapped patients to productive or at least self-sufficient living.

Drugs to Consider in Treatment of Cerebral Vascular Accidents

Anticoagulants.—Patients with cerebral vascular accidents of any type, who may develop peripheral venous thrombosis or mural thrombi and (if myocardial infarction is a complication) who may subsequently develop emboli to the lungs and other sites of infarction, can be protected by the use of anticoagulants and the mortality from the disease reduced. However, the use of anticoagulants in cerebral vascular disease must be evaluated in terms, not of the death rate, but of the effect on the cerebral lesion, if possible. Since, in bleeding aneurysms or cerebral hemorrhage, the use of anticoagulant therapy would hasten the patient's death, it is evident that anticoagulants can be used only in selected cases.

The use of bishydroxycoumarin (Dicumarol) and related long-term anticoagulants has received a great deal of attention lately. Theoretically, it has much to recommend it in some instances. If a diseased area of the vascular system is such as to favor fragile clot formation, so that particles of coagulated blood (emboli) break off into the systemic circulation and travel to the cerebral vasculature, adequate anticoagulant therapy maintained until the vascular disease

is cured or arrested should theoretically prevent the formation of further emboli and prevent further cerebral vascular occlusion and brain infarction. There would appear to be excellent theoretical reasons and strongly suggestive clinical observations supporting the notion that, in proved cases of cerebral embolization, anticoagulants should be given under close supervision for a prolonged period. For example, bishydroxycoumarin given in sufficient doses to maintain the prothrombin level in a therapeutic range should be maintained for a period of not less than six months. Blood prothrombin determinations should be done every 7 to 10 days. To specify a prothrombin level in terms of percent of normal is hazardous. Figures varying from 10 to 40 percent of normal are recommended by different authorities. The physician should consult with the laboratory which is to perform the test. It is preferable that the determinations be performed always in the same laboratory and by the same method. The physician should determine from this consultation what the appropriate prothrombin level to produce reduced coagulability should be, according to the standards of the laboratory.

Heparin sodium (Heparin Sodium, Liquaemin Sodium) may be used in urgent situations in which embolic episodes are occurring at frequent intervals. Although it is difficult to prove in an individual patient that the embolic phenomena did not terminate spontaneously, it would appear that the foregoing type of therapy is the preferred method of treatment at the present time.

If a clot or thrombus has formed in a small branch of a cerebral artery or a vein, as the result of disease of that artery or vein, and if insufficient time has elapsed to allow endothelization of the intravascular surface of the clot, the thrombus may act as a nidus for the growth and extension of the thrombus. Obstruction of a larger vessel may result, with more extensive or clinically apparent brain damage. Theoretically, a decrease in the coagulability of the blood would reduce the likelihood of growth or extension of the thrombus. It has been postulated in some instances that sludging can occur temporarily and result in cerebral ischemia without thrombosis. Although the mechanism of sludging has been observed in certain superficial vessels, no data are available on its occurrence in the cerebral circulation.

With the aforementioned two theoretical principles in mind, physicians are apparently prepared to treat two common forms of cerebral vascular accident, i.e., thrombosis and transient cerebral ischemia. Although experience is increasing, controlled studies proving the effectiveness of these two theoretical uses of anticoagulants have not yet been accomplished. Clinical experience, however, suggests that anticoagulants are worth a trial in well-defined cerebral arteritis of an infectious or chemical etiology with thrombosis, in order to prevent extension of the thrombus formation.

The use of anticoagulant drugs in the patient with cerebral arterial thrombosis associated with atherosclerosis theoretically might be of value in preventing the extension of the thrombus, as was indicated. However, difficulties in differential diagnosis of this disorder and intracranial hemorrhage make its use hazardous.

Furthermore, in any proposed use of an anticoagulant in the prophylactic care of cerebral vascular accidents, individual consideration must be given to weighing the good likely to be accomplished against the possibility of dangerous bleeding from unsuspected sources. Whether from dietary inadequacies or constitutional differences, patients vary greatly in their response to anticoagulants, and assurance must be had that prothrombin determinations will be consistently reliable and frequent enough to determine and maintain safe dosage.

There would seem to be agreement that, when a fully developed stroke or complete neurological syndrome occurs as the result of intravascular cerebral thrombosis, the use of anticoagulants for the purpose of preventing further strokes is not justified.

The problem revolves around the treatment of transient, minor strokes which have the potentiality of recurring or extending. Not only is it difficult to be sure of the etiology of the so-called minor stroke, but its differentiation from other forms of neurological disease by the average physician is difficult.

It is also difficult to contemplate treating all older patients, who have transient episodes of giddiness and transient numbness and tingling and other minor neurological symptoms, with anticoagulants for periods up to six months. Yet, in a given case, if these symptoms are truly prodromata of an impending cerebral vascular accident of the thrombotic type, anticoagulants theoretically would be indicated.

In my opinion, the use of anticoagulants in the treatment of cerebral vascular accidents should be confined to the type of cases in which well-controlled studies have shown the drug to be effective, i.e., cerebral embolism and chemical or infectious arteritis. Certainly, a few successful trials of this method of treatment by the individual physician is poor indication that the drug is useful.

Fibrinolysins.—The use of fibrinolysins to dissolve thrombi has not been tried successfully in the therapy of cerebral vascular thromboses.

Vasodilators.—One of the unknowns in the pathophysiology of cerebral vascular disease is the role of vasospasm, either in the production of impaired neural function without infarction or in neural damage produced by a thrombus or embolus and its resultant ischemia. That gross spasm in cerebral blood vessels can occur has been demonstrated, but a serious question can be raised as to whether this is good or bad for the patient. In subarachnoid hemorrhage, blood vessel spasm may offer some protective hemostasis to the patient. In the pale infarct stage resulting from thrombosis, vasospasm may contribute to the size and growth of the infarct. Furthermore, it must not be assumed that absence of spasm improves circulation in the brain. Indeed, there is experimental evidence to suggest that vasodilatation may reduce blood flow to certain areas.

Stellate ganglion block has been used extensively but, for the most part, is losing favor. The absence of controlled studies, the difficulty of evaluating its effect on a transient phenomenon, the theory behind its use, and the complications, e.g., pneumothorax, indicate it should not be used freely or by inexperienced hands.

Numerous chemical vasodilators are available, but, considering the precise control of the cerebral circulation by neural and humoral mechanisms, vasodilators with an effect on the systemic circulation would probably act peripherally before a cerebral effect is manifest, and the net result might be reduced blood flow.

Possibly the safest vasodilator known to have an effect on the cerebral vessels is carbon dioxide. This drug, used by inhalation over a period of a few minutes, can be tried in an attempt to produce a beneficial effect. If it is ineffective, it can be withdrawn immediately.

Miscellaneous Drugs.—To date, drugs that are useful in prevention or definitive treatment of cerebral vascular accidents are not available. Miscellaneous drugs are involved occasionally in the treatment of patients with cerebral vascular accidents, but the use of these has to be adjusted to the individual case. The routine use of antibiotics to prevent pneumonia should be restricted to those patients in whom the likelihood of pneumonia is high. Morphine should be avoided completely because of the effect of this drug on the respiratory center. Indeed, drugs which tend to alter the state of consciousness should be avoided insofar as possible. For the control of extreme restlessness, paraldehyde remains the drug of choice. Attention should be paid to general supportive measures such as diet, electrolyte and fluid balance, and bladder, skin, and bowel care.

J. Am. Med. Assoc. **172:562 (Feb. 6) 1960.**

POSITIONS

in hospital pharmacy

PERSONNEL PLACEMENT SERVICE

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ASST. CHIEF PHARMACIST—225 bed general hospital in Hawaii. Assist chief pharmacist; charge of dept. in chief pharmacist's absence. Must be eligible for licensure in Hawaii. Forty hour week, vacation, holidays, annual sick leave, insurance and retirement plans. PO-191

STAFF PHARMACIST—300 bed general hospital. Filling inpatient and outpatient orders, filling narcotic orders, assume responsibility of prepackaging and filling ward stock orders. Must be registered in Ohio. Female preferred between the age of 25-40. Forty hour week, vacation, paid holidays, sick leave and insurance. PO-190

CHIEF PHARMACIST—2300 bed mental hospital. Pharmacist will have complete charge of pharmacy, drug orders, stocking, dispensing, compounding, necessary records and other pharmacy duties. Must be licensed in Ohio. Forty hour week, vacation, holidays, insurance, retirement plan and sick leave benefits. PO-189

CHIEF PHARMACIST—500 bed general county hospital. California licensure and Civil Service Examination required. PO-188

CHIEF PHARMACIST—212 bed general hospital located in Iowa. Will be responsible for entire pharmacy operation, purchase of drugs and general medical supplies, and will assist in in-service training of registered nurses. Must be registered with hospital experience preferred. Forty hour week, vacation, holidays, sick days and insurance. PO-187

STAFF PHARMACIST—325 bed general hospital located in Pa. Duties include filling requisitions from the various nursing stations for floor drugs and completing specific prescriptions to patients. Forty hour week, vacation, group hospitalization. PO-186

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CHIEF AND STAFF PHARMACISTS—180 bed general hospital. Duties include compounding prescriptions for hospital patients as well as take-home prescriptions, ordering and pricing drug items. Must be eligible for licensure in Calif. Forty hour week, vacation, insurance, sick leave and holidays. PO-179

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STAFF PHARMACIST—290 bed general medical and surgical city hospital. Duties include compounding, dispensing, manufacturing, and assisting in the purchasing of supplies. Prepares reports and maintains records. Furnishes information concerning medications to physicians and nurses. In absence of associate pharmacist will assist with special duties as assigned by chief pharmacist. Male or female between 23-45 years of age. Ohio registration required. Hospital pharmacy internship preferred. Forty hour week, vacation, sick leave, retirement plan, holidays and insurance. PO-170

STAFF PHARMACIST—200 bed general hospital. Duties include compounding, dispensing and manufacturing. Applicant must have B.S. in Pharmacy and be registered in Conn. Recent graduate acceptable. Forty-four hour week, vacation, pension plan and hospitalization. PO-168

ASST. CHIEF PHARMACIST—102 bed general hospital located in Oregon. Pleasant surroundings in college city of 8,000-20,000 students. Male or female. Must be registered. Forty hour week, vacation, holidays and sick days. PO-166

ASST. CHIEF PHARMACIST—350 bed general hospital. Assist in training and supervision of employees and in plans and projects of dept. Direct dept. in absence of chief pharmacist. Registration in Ohio and B.S. Degree required. Only male considered, must be over 21 years of age. Forty hour week, vacation, holidays, hospitalization and sick leave. PO-165

STAFF PHARMACIST—100 bed general hospital located in Texas. Assume personal responsibility for accurate filling of prescriptions and supplies, assist in inspecting drugs in nursing stations, replace stock taken from night emergency container, inspect and refill ophthalmic solution trays from operating room, emergency room and central supply. Female preferred. Must be registered or eligible for registration in Texas. Forty hour week, vacation, paid holidays and sick leave. PO-164

ASST. CHIEF PHARMACIST—280 bed general hospital. Duties include filling prescriptions and medication orders from various units, supervise pharmacy clerks, assume administrative responsibility when chief pharmacist is absent. Forty-four hour week, sick leave and paid holidays. Must be registered in Ill. PO-161

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STAFF PHARMACIST—269 bed nonprofit general hospital located in Calif. Duties include filling ward orders, individual prescriptions, outpatient prescriptions and narcotic orders. Applicant must have B.S. in Pharmacy, one year's experience or preferably hospital pharmacy internship. Willingness to work weekends and nights as required. Male or female. Forty to forty-eight hour week, vacation, holidays, sick leave and insurance plan. PO-157

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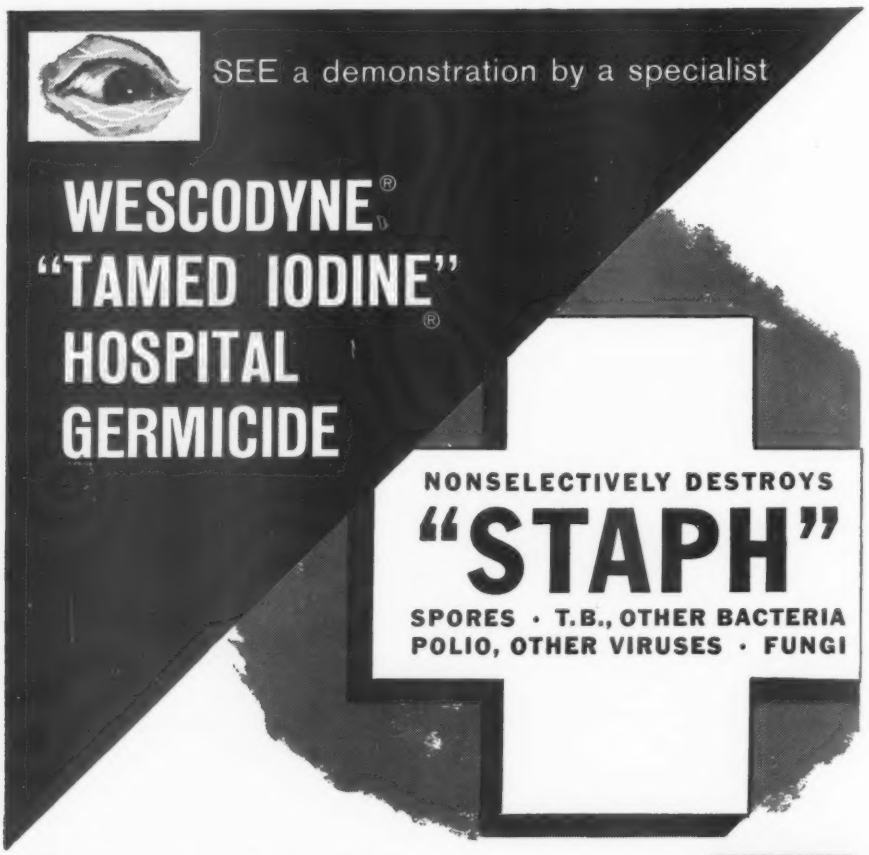

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ASST. CHIEF OR CHIEF PHARMACIST—Male, married. Obtained M.S. at St. Louis College of Pharmacy and Allied Sciences in January 1960. Served hospital pharmacy internship. Eighteen months' hospital pharmacy experience. Prefers to locate in the Midwest. Registered in Mo. PW-233

PHARMACIST—Female, single. Will obtain B.S. at the State University of Iowa in June 1960. Prefers to locate in the East. PW-232

ASST. CHIEF OR CHIEF PHARMACIST—Male, single. Will receive M.S. in Hospital Pharmacy and will complete hospital pharmacy internship in June. Military requirements fulfilled. Prefers Eastern section of U.S., but willing to locate anywhere. Registered in Ga. and Md. PW-231

CHIEF PHARMACIST—Male, married. Obtained B.S. at Massachusetts College of Pharmacy in 1943. Nine years' hospital pharmacy experience. Prefers to locate in East. Registered in Conn. and Mass. PW-230

STAFF OR CHIEF PHARMACIST—Male, married. B.S. obtained from University of Minnesota in 1953. Served hospital pharmacy internship. Three years' hospital pharmacy experience. Registered in Minn. Prefers to locate in the West or Southwest. PW-229

ASST. OR CHIEF PHARMACIST—Male, married. Will obtain B.S. at Philadelphia College of Pharmacy and Science in June, 1960. One year's experience as an apprentice pharmacist at Jefferson Medical College Hospital. Will locate anywhere. Expects to become registered in Pa. first, but willing to take state board examination in any state. PW-228

PHARMACIST—Male, married. B.S. received at Howard College of Pharmacy in 1956. Served hospital pharmacy internship. Two years' hospital pharmacy experience. Prefers to locate in Florida. Registered in Florida and Alabama. FW-227

PHARMACIST—Female, single. M.S. received at University of Maryland in 1951. Served hospital pharmacy internship. Five years' hospital pharmacy experience. Prefers to locate in New Jersey. Registered in Pa. and Mo. PW-225

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. B.S. received at Detroit Institute of Technology in 1950. Four years' hospital pharmacy experience. Prefers to locate in Michigan; registered in Michigan. PW-224

STAFF PHARMACIST—Female, single. Received B.S. at Auburn University in 1952. Three years' hospital pharmacy experience. Prefers Florida, registered in Alabama. PW-223

CHIEF PHARMACIST—Male, married. B.S. received at University of Wisconsin in 1957. Four years' hospital pharmacy experience. Prefers to locate in Wisconsin; registered in Wisconsin. PW-222

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. Received B.S. at Medical College of South Carolina in 1950. Four years' hospital pharmacy experience. Prefers Southeast section of country. Registered in N. C. and S. C. PW-221

CHIEF PHARMACIST—Male, single. Received M.S. at University of Michigan in 1957. Six years' hospital pharmacy experience. Served hospital pharmacy internship. Will locate anywhere. Registered in Mich. and Ohio. PW-200

STAFF PHARMACIST—Female, single. B.S. received at Purdue University in 1958. One and one-half years' hospital pharmacy experience. Registered in Indiana. Prefers to locate in East or Midwest. PW-219

CHIEF PHARMACIST—Male, single. B.S. received in 1952 at Mass. College of Pharmacy. Seven years' hospital pharmacy experience. Registered in Mass. Will locate anywhere. PW-218

STAFF OR CHIEF PHARMACIST—Male, single. B.S. received in 1952 at St. Louis College of Pharmacy. Two years' hospital pharmacy experience. Registered in Mo. Prefers West Coast, particularly Calif. PW-217

ASST. CHIEF OR STAFF PHARMACIST—Female, single. B.S. received at University of Saskatchewan in 1954. Three years' hospital pharmacy experience. Registered in Canada. Would prefer to locate in Southwestern or Western part of U.S. PW-216

CHIEF PHARMACIST—Male, married. Will receive M.S. in June, 1960 at the State University of Iowa. Served hospital pharmacy internship. Registered in Iowa, prefers to locate in the northern Midwest. PW-215

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. B.S. received in 1954 at the Southwestern State College in Okla. Served hospital pharmacy internship at Springfield City Hospital, Springfield, Ohio. Three years' hospital pharmacy experience. Registered in Okla., prefers to locate in Southwest. PW-214

CHIEF PHARMACIST—Male, married. M.S. received from Philadelphia College of Pharmacy and Science in 1958. Served hospital pharmacy internship. Four years' hospital pharmacy experience. Presently completing military obligations. Will locate anywhere and will be available after July, 1960. Registered in Ohio. PW-210

CHIEF PHARMACIST—Male, married. Received B.S. in 1957 at Brooklyn College of Pharmacy. Over one year hospital pharmacy experience. Registered in N. Y. and Ill. Prefers East. PW-207

ASST. CHIEF PHARMACIST—Male, single. B.S. received in 1956 at Columbia University College of Pharmacy. Served hospital pharmacy internship. Two years' hospital pharmacy experience. Registered in N. Y. Prefers New York City. PW-206

DIRECTOR OF PHARMACY SERVICE AND/OR CHIEF PHARMACIST—Male, married. Served hospital pharmacy internship and received M.S. in Hospital Pharmacy from the University of Michigan in June 1959. Seven years' hospital pharmacy experience. Registered in Ill. and Mich. Will locate anywhere. PW-205

CHIEF PHARMACIST—Male, married. M.S. received from Philadelphia College of Pharmacy and Science in 1957. Served hospital pharmacy internship. Over four years' hospital pharmacy experience. Registered in Nebr., Ky., Iowa, and Pa. Prefers Midwest. PW-204

STAFF PHARMACIST—Female, single. B.S. Seven years' hospital pharmacy experience. Southwest section of country preferred. Registered in Ala. and Ga. PW-199

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. B.S. received at Philadelphia College of Pharmacy and Science, 1956. Two and one-half years' hospital pharmacy experience and six years' experience in manufacturing, mainly parenterals. Presently working in Nicaragua. Will locate anywhere in U.S. PW-197

CHIEF PHARMACIST—Male, married. B.S. received in 1953. Four years' hospital pharmacy experience. Prefers Eastern part of country. Registered in Pa. and N.Y. PW-195

CHIEF PHARMACIST—Male, married. M.S. Hospital experience. Prefers to locate in East. Registered in N.Y., Mich., N.J., and Fla. PW-184

ASST. CHIEF OR CHIEF PHARMACIST—Male, B.S. received in 1954. Desires to locate in Mich., Ohio or Ill. Registered in Mich. PW-177

PHARMACIST—Female. Graduate of the University of Idaho, 1954. Registered in Ill. Hospital experience. Prefers Chicago area. PW-166

CHIEF OR ASST. CHIEF PHARMACIST—Female. B.S. and M.S. Purdue University. Ten years' hospital pharmacy experience. Registered in Ind. and Ky. PW-164

PHARMACIST—Male. Registered in La. and Mo. Experienced. Prefers Midwest. PW-161

ASST. CHIEF PHARMACIST—Male, single. Registered in N.Y. and Vt. Served hospital pharmacy internship, now employed part-time staff pharmacist. Prefers Eastern part of country. Has M.S., four years' hospital pharmacy experience. PW-154

CHIEF PHARMACIST—Male, married. B.S. Ten years' hospital pharmacy experience. Registered in Mass., Ill., Mo., Ky., Tenn., and Va. PW-150

PHARMACIST—Male, single. B.S. pharmacy, June 1959. Prefers to locate in East. PW-149

ASST. CHIEF OR CHIEF PHARMACIST—Single, male. Registered in D.C., Ill., Md., and Pa. Graduate University of Pittsburgh in 1953, experience in research. Prefers North and East. PW-148

ASST. DIRECTOR OR DIRECTOR OF PHARMACY SERVICES—Male, single. B.S. Retail and five years' hospital experience. Registered in Ill. PW-119

CHIEF PHARMACIST—Female, single. Registered in Pa. and Ohio. Twelve years' experience as chief pharmacist. Desires to locate in Pa. or Ohio. PW-111

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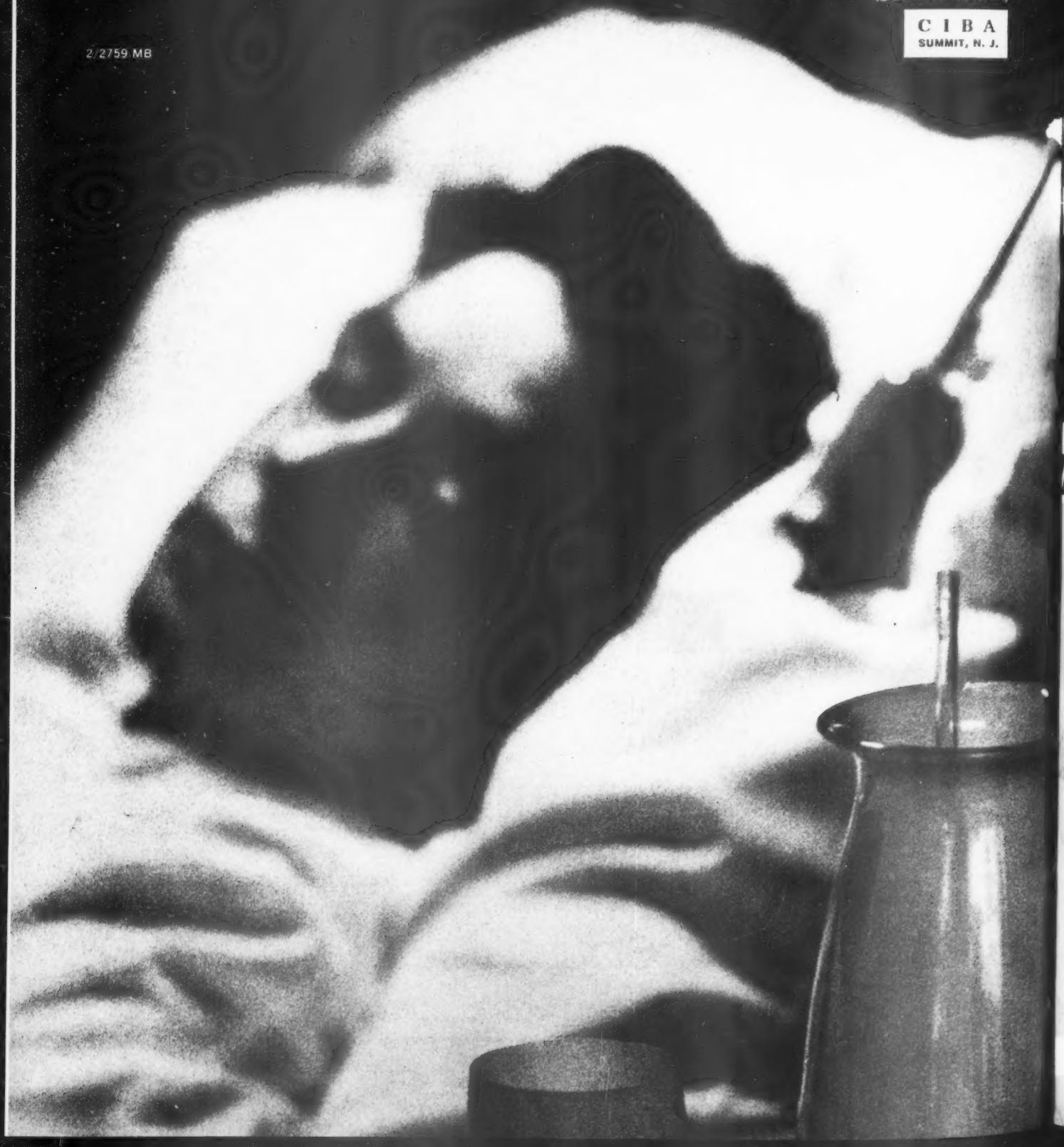
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